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The Words and Writings of

JOHN L. PIOTROWSKI

General
United States Air Force

COMMANDER IN CHIEF
NORTH AMERICAN
AEROSPACE DEFENSE COMMAND

COMMANDER IN CHIEF
UNITED STATES
SPACE COMMAND

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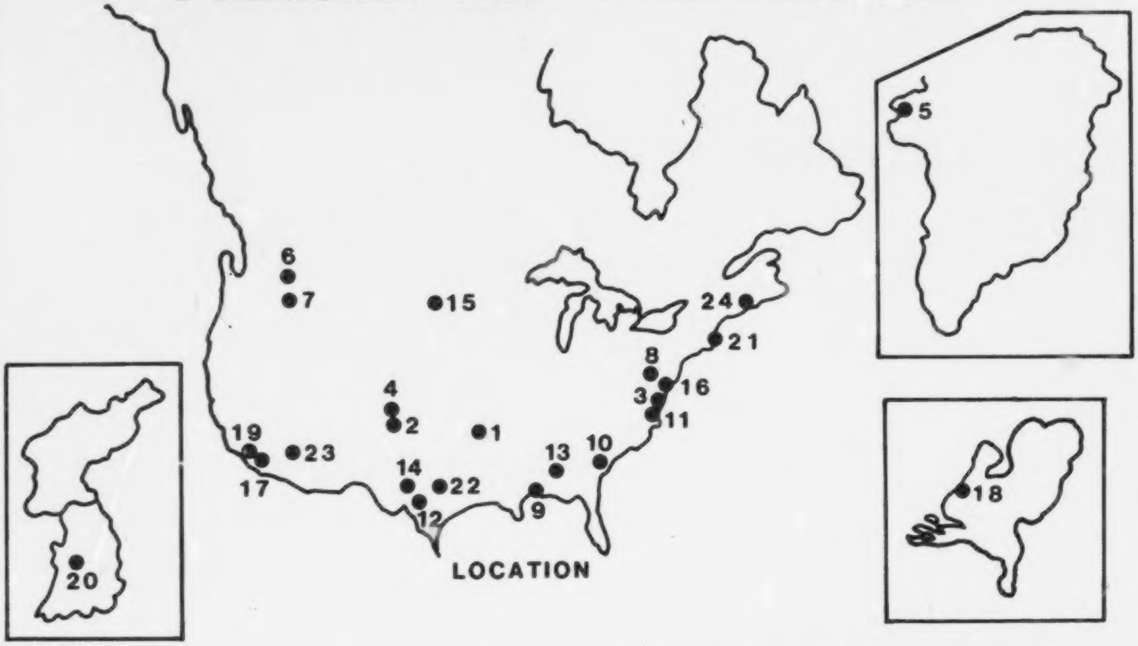

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GENERAL JOHN L. PIOTROWSKI
OKLAHOMA CITY CHAMBER/LOGISTICS CENTER "SALUTE"
TINKER AIR FORCE BASE, OKLAHOMA
4 MARCH 1988

ACKNOWLEDGMENTS . . . .

I'D BE TERRIBLY REMISS, IF I DID NOT TAKE THIS OPPORTUNITY TO THANK OUR COMMUNITY PARTNERS FROM THE CHAMBER OF COMMERCE FOR THIS WONDERFUL AND WARM EVENING. I THINK WE ALL RECOGNIZE THAT THE CIVIL-MILITARY RELATIONSHIP WHICH IS EXHIBITED HERE, IS A PRODUCT OF HARD WORK AND FAITHFUL PARTNERSHIP. IT'S NOT A ONE-WAY STREET, BUT RATHER A TESTIMONY TO THE GIVE AND TAKE . . . THE MELDING OF AIRMEN AND CIVILIANS INTO JUST PLAIN CITIZENS. WE ALL PARTICIPATE IN THE ECONOMIC AND SOCIAL STRUCTURE OF THE COMMUNITY AND WE SHARE THE SAME INTEREST . . . BEING GOOD NEIGHBORS. AND A HEALTHY LOCAL AND NATIONAL ECONOMY.

IT SHOULD COME AS NO SURPRISE TO YOU, THAT THE SPIRIT OF FRIENDSHIP AND COOPERATION BETWEEN THE AIRMEN OF TINKER AND THE PEOPLE OF OKLAHOMA CITY AND NEARBY COMMUNITIES IS LEGEND. I FOR ONE REMEMBER IT WELL AND I WANT TO THANK YOU AS THEIR REPRESENTATIVE.

ALL OF US HAVE RECENTLY BEEN INUNDATED, WITH INFORMATION REGARDING THE ACCOMMODATION REACHED BY CONGRESS AND THE ADMINISTRATION WITH RESPECT TO MANAGING THE FEDERAL DEFICIT, AND CUTS TO DEFENSE SPENDING. I AGREE THAT WE NEED TO SEARCH FOR EVEN MORE INNOVATIVE, YET PRUDENT WAYS TO MAINTAIN AND IMPROVE THE COMBAT CAPABILITY OF OUR FORCES, AND DO IT AT A LOWER COST. I BELIEVE THAT ONE OF THE WAYS WE CAN DO THAT IS, BY BETTER APPLYING CURRENT TECHNOLOGY TO SPACE SYSTEMS, AND BY OPERATING THOSE SPACE SYSTEMS IN WAYS THAT SIGNIFICANTLY IMPROVE THE SUPPORT THAT SPACE SYSTEMS PROVIDE TO OUR TERRESTRIAL FORCES. HAVING SAID THAT I MUST SHARE WITH YOU MY STRONG BELIEF THAT THERE IS NO WAY THE DEPARTMENT OF DEFENSE CAN TAKE 33 BILLION DOLLARS IN CUTS IN ONE YEAR AND THE AIR FORCE AN ADDITIONAL 25 BILLION DOLLARS OVER THE NEXT FOUR YEARS WITHOUT THE DEEP DRASTIC CUTS IN FORCE STRUCTURE THAT RESULT IN INCREASED RISK. WE SEE IT IN REDUCED FORCES, REDUCED READINESS, LOWER PERSONNEL STRENGTH. WE NEED THE FREEDOM TO APPLY SOUND MILITARY JUDGMENT TO MINIMIZE THAT RISK. ALL ELEMENTS OF NATIONAL POWER SPRING FROM A STRONG ECONOMY.

OVER THE YEARS, WE HAVE DEVELOPED TREMENDOUS TECHNOLOGY AND APPLIED IT TO OUR SPACE SYSTEMS AT AN INCREDIBLY RAPID PACE. AS YOU KNOW, TODAY'S SPACE SYSTEMS, IN MOST CASES, BEAR LITTLE RESEMBLANCE TO

THEIR PREDECESSORS IN TERMS OF CAPABILITY AND RELIABILITY. OUR APPROACH TOWARD EXPLOITING TECHNOLOGY FOR SPACE SYSTEMS HAS BEEN FOCUSED ON EXPANDING THE CAPABILITY AND CAPACITY OF SPECIFIC SYSTEMS.

WHILE THE PAYOFFS OF THIS APPROACH HAVE BEEN TREMENDOUS, I BELIEVE THAT WE COULD SIGNIFICANTLY IMPROVE OUR OVERALL MILITARY POSTURE BY ALSO APPLYING THE FOUR DEFENSE PILLARS OF "READINESS," "SUSTAINABILITY," "FORCE STRUCTURE," AND "MODERNIZATION" TO THE DEVELOPMENT AND OPERATION OF OUR SPACE FORCES. LET ME GIVE SOME EXAMPLES OF HOW THIS APPROACH MIGHT BE APPLIED. I'LL BEGIN BY TALKING ABOUT "FORCE STRUCTURE."

TECHNOLOGICAL ADVANCES HAVE MADE IT POSSIBLE FOR SINGLE SPACECRAFT TO ROUTINELY PERFORM MULTIPLE TASKS. WHILE THIS APPROACH MAKES IT POSSIBLE TO AVOID SIGNIFICANT LAUNCH-RELATED COSTS, IT ALSO HAS AN OPERATIONAL DOWNSIDE. IT HAS ENCOURAGED US TO DEPEND ON A SMALL FAMILY OF LAUNCH SYSTEMS AND A SET OF PROCEDURES WHICH REQUIRE MONTHS----AS OPPOSED TO WEEKS, OR EVEN DAYS----TO PLACE PAYLOADS IN ORBIT.

WE ALSO RELY ON A MODEST ARRAY OF LAUNCH PADS AND PEACETIME TECHNIQUES WHICH MAKE IT ALL BUT IMPOSSIBLE TO CONDUCT ANY KIND OF SHORT-NOTICE OR REDUCED-INTERVAL LAUNCHES IN CRISIS OR CONFLICT.

OUR TECHNOLOGY HAS ALSO BEEN TRANSLATED INTO SUCH TREMENDOUSLY CAPABLE SATELLITES, THAT WE HAVE COME TO RELY ON AN ORBITAL FORCE STRUCTURE WHICH IS VERY LONG ON PERFORMANCE, BUT TERRIBLY SHORT IN TERMS OF NUMBERS. GIVEN THEIR MULTI-MISSION CAPABILITY, THEIR EXTREMELY HIGH OPERATIONAL VALUE, AND FAIRLY LIMITED NUMBERS, SOME OF OUR SPACE SYSTEMS ALSO REPRESENT A LUCRATIVE TARGET SET FOR EXISTING SOVIET ANTISATELLITE SYSTEMS.

OUR SPACE SYSTEMS, ALONG WITH THE LAUNCH VEHICLES AND INFRASTRUCTURE WHICH SUPPORT THEM, ARE WELL-SUITED TO THE DEMANDS PLACED UPON THEM IN PEACETIME. IN FACT, SOME OF OUR SYSTEMS ARE SO CAPABLE AND HANDLE SO MUCH DATA IN SUCH VOLUME, THAT THEY EASILY FILL A COMMANDER'S REQUIREMENT FOR USEFUL INFORMATION DURING COMBAT SITUATIONS.

YET, IN SPITE OF THEIR INCREDIBLE CAPABILITY, OUR SPACE FORCES MAY BE TOO FRAGILE, AND MAY LACK THE DEGREE OF STAYING POWER WHICH I BELIEVE IS NECESSARY IN ANY MILITARY FORCE OR OPERATION. THEY MAY ALSO LACK THE NUMBERS TO SUPPORT GLOBAL OPERATIONS.

THERE IS NO QUESTION THAT OUR ON-ORBIT SYSTEMS RANK VERY HIGH AGAINST THE PILLAR OF "READINESS" IN PEACETIME. BUT, GIVEN THEIR POTENTIAL VULNERABILITY TO SOVIET SPACE CONTROL WEAPONS AND TACTICS . . . OUR LACK OF BOTH GROUND AND ON-ORBIT SPARES . . . AND THE LONG TIME REQUIRED TO REPLACE LOSSES . . . OUR SYSTEM MUST BE RANKED VERY LOW AGAINST THE EQUALLY IMPORTANT PILLAR OF "SUSTAINABILITY."

SIMILARLY, OUR LAUNCH INFRASTRUCTURE IS "READY" IN THE SENSE THAT IT CAN SUPPORT NORMAL OPERATIONS WHICH HAVE BEEN SCHEDULED MANY MONTHS, OR EVEN YEARS IN ADVANCE. BUT WE HAVE A VERY LIMITED NUMBER OF LAUNCH PADS, EACH OF WHICH CAN SUPPORT ONLY ONE TYPE OF BOOSTER. FURTHER, THE LENGTHY PROCESS OF PREPARING BOOSTERS AND THEIR PAYLOADS ON THE PADS----AS OPPOSED TO DOING THE INTEGRATION AT AN ADJACENT FACILITY----MAKES IT DIFFICULT TO LAUNCH AT OTHER THAN A PEACETIME PACE.

CONSEQUENTLY, OUR LAUNCH INFRASTRUCTURE LACKS "READINESS" IN THAT IT IS INCAPABLE OF SUPPORTING UNSCHEDULED OR CONTINGENCY OPERATIONS. EVEN IF ONE OR TWO LAUNCHES WERE SUCCESSFULLY ACCOMPLISHED ON SHORT NOTICE, TIMELY LAUNCH OPERATIONS COULD NOT BE CONDUCTED AT THE RATE THAT WOULD BE NECESSARY TO REPLACE LOSSES CAUSED BY DETERMINED ATTACKS ON OUR SATELLITES.

THE LAUNCH INFRASTRUCTURE, THEREFORE, MAY LACK "SUSTAINABILITY," AS WELL AS "READINESS" AND "FORCE STRUCTURE." UNFORTUNATELY, THESE OPERATIONAL LIMITATIONS ARE NOT EXCLUSIVE TO OUR ON-ORBIT AND LAUNCH SYSTEMS.

OUR GROUND-BASED SATELLITE CONTROL FACILITIES AND SPACE SURVEILLANCE SITES ARE FULLY CAPABLE OF PERFORMING NORMAL OPERATIONS IN PEACETIME. BUT MANY OF THESE SITES ARE IN REMOTE AREAS ON FOREIGN SOIL, AND NOT EASILY DEFENDED. CONSEQUENTLY, THEY ARE VULNERABLE, AND COULD BE POLITICALLY NEUTRALIZED OR LOST TO HOSTILE ACTION . . . EVEN DURING THE EARLY STAGES OF A CRISIS OR CONFLICT.

WHILE THERE IS SOME REDUNDANCY IN OUR SATELLITE CONTROL, TRACKING, AND SURVEILLANCE NETWORKS, WE CAN ILL-AFFORD TO LOSE ANY OF THESE FACILITIES. I AM CERTAIN THE SOVIETS REALIZE, THAT TO CONTROL SPACE YOU DON'T HAVE TO PHYSICALLY ATTACK SPACECRAFT, AS THE SOLE MEANS OF IMPEDING THEIR OPERATION.

THEY REALIZE THAT THE VITAL SUPPORT PROVIDED BY OUR ON-ORBIT SYSTEMS, MIGHT NOT BE SUSTAINED IF KEY GROUND-BASED FACILITIES WERE TAKEN OUT OF THE ACTION. GIVEN THEIR OWN APPRECIATION FOR SPACE AS AN OPERATIONAL MEDIUM, I THINK IT IS SAFE TO ASSUME THAT

THE SOVIETS HAVE MADE A CONCENTRATED EFFORT TO IDENTIFY ANY WEAK POINTS IN OUR SPACE SYSTEMS AND THE WAY WE OPERATE THEM.

OVER THE YEARS, WE HAVE CAPITALIZED ON TECHNOLOGY AND THE STRATEGIC ADVANTAGES OFFERED BY THE MEDIUM OF SPACE. WE HAVE DEVELOPED AND DEPLOYED SPACE SYSTEMS OF TREMENDOUS VALUE TO OUR LAND, SEA, AND AIR FORCES. YET, I DO NOT BELIEVE THAT WE FULLY APPRECIATE A FUNDAMENTAL POINT: THAT IS, THE HIGHER THE OPERATIONAL VALUE OF A SYSTEM OR A FORCE, THE MORE COMPELLING THE REASONS TO ENSURE IT CAN SUSTAIN LOSSES, AND CONTINUE TO PROVIDE SUPPORT TO THE FORCES WHICH DEPEND HEAVILY UPON IT.

IT IS EQUALLY CLEAR TO ME THAT OUR SPACE FORCES LACK "FORCE STRUCTURE," "READINESS," AND "SUSTAINABILITY" COMMENSURATE WITH THEIR OPERATIONAL VALUE. IF A VIGOROUS SPACE CONTROL CAMPAIGN WAS DIRECTED AT OUR GROUND-BASED AND ORBITAL SYSTEMS, IT IS QUITE LIKELY THAT WE WOULD SUFFER SIGNIFICANT LOSSES. OUR CAPACITY TO PROMPTLY REPLACE POTENTIAL LOSSES WITH A READY RESERVE OF LAUNCHABLE, OR ON-ORBIT ASSETS IS MARGINAL AT BEST. UNFORTUNATELY, THE SAME HOLDS TRUE FOR OUR GROUND-BASED RESOURCES.

AS YOU KNOW, THE PAST SIX YEARS HAVE FEATURED SIGNIFICANT GROWTH IN DEFENSE SPENDING AND CORRESPONDING IMPROVEMENTS IN OUR MILITARY POSTURE. ONE OF THE REASONS WHY WE HAVE GOTTEN SO MUCH OUT OF THE DOLLARS INVESTED, IS BECAUSE THE DEPARTMENT OF DEFENSE HAS APPLIED THE FOUR PILLARS OF MILITARY CAPABILITY TO DEFENSE PROGRAMS AND OPERATIONS.

IF EVALUATING FORCES IN TERMS OF THOSE FOUR PILLARS PROVED USEFUL DURING YEARS OF GROWTH, IT SEEMS OBVIOUS THAT IT WILL PROVE USEFUL DURING THE MORE AUSTERE TIMES WHICH ARE NOW UPON US. IT WOULD BE FOOLHARDY TO TREAT SPACE AS SO UNIQUE, THAT WE NOT APPLY THAT APPROACH TO OUR CURRENT AND EMERGING SPACE FORCES.

WE CAN BEGIN BY FIRST ACCEPTING THE POINT THAT SPACE FORCES MUST BE DESIGNED TO SUPPORT LARGE SCALE, EVEN RAPIDLY-PACED, GLOBAL MILITARY OPERATIONS, RATHER THAN JUST VERY PRECISE, EXACTING OPERATIONS IN A FRIENDLY ENVIRONMENT. ACCEPTING THAT, WE NEED TO CAREFULLY EXAMINE EMERGING PROGRAMS TO DETERMINE HOW THEY MIGHT BE MADE MORE RESPONSIVE TO OPERATIONAL COMMANDERS UNDER WARTIME CONDITIONS.

AS TIME GOES BY, I BECOME MORE SOLIDLY CONVINCED THAT WE NEED TO IMPROVE THE "READINESS" AND "SUSTAINABILITY" OF OUR SPACE FORCES. I BELIEVE THAT WE SHOULD HAVE THE CAPABILITY TO ADJUST THE READINESS OF OUR SPACE FORCES TO ACCOMMODATE THE REQUIREMENTS OF GLOBAL MILITARY OPERATIONS, OR THE CHANGING TACTICAL SITUATION FACED BY A SINGLE THEATER COMMANDER.

A COMMANDER ENGAGED IN COMBAT SHOULD BE ABLE TO RECEIVE THE SPACE SUPPORT HE REQUIRES AS PROMPTLY AND EFFICIENTLY AS HE WOULD EXPECT AIR SUPPORT, NAVAL SUPPORT, OR HIS OWN ARTILLERY SUPPORT. AND HE SHOULD EXPECT TO RECEIVE THAT SUPPORT FOR AS LONG AS HE NEEDS IT. THAT'S THE KIND OF "READINESS" THAT COUNTS BECAUSE THAT'S THE KIND OF SUPPORT THAT ALLOWS US TO ACHIEVE OUR OBJECTIVES.

SOME "SUSTAINABILITY" DEFICIENCIES CAN BE REDRESSED THROUGH REASONABLE INCREASES IN "FORCE STRUCTURE." FOR EXAMPLE, BOTH THE READINESS OF OUR ORBITAL SYSTEMS, AND SUSTAINABILITY OF THE SUPPORT THEY PROVIDE TO OUR FORCES COULD BE SIGNIFICANTLY IMPROVED BY REDUCING THE AMOUNT OF TIME REQUIRED TO GET PAYLOADS INTO ORBIT.

"SUSTAINABILITY" COULD ALSO BE IMPROVED BY MAINTAINING RESERVE SPACECRAFT IN ORBITS WHERE THEY ARE LESS VULNERABLE TO ATTACK. SUCH SATELLITES WOULD NOT NECESSARILY POSSESS ALL THE CAPABILITIES OF THE SATELLITES THEY WOULD REPLACE. BUT THEY WOULD PROVIDE THE FUNDAMENTAL SERVICES REQUIRED BY OUR OPERATIONAL COMMANDERS.

THE SIZE, CAPACITY, AND FUNCTIONS PROVIDED BY SUCH A RESERVE FORCE COULD ALSO BE INCREASED AND ADJUSTED DURING CRISIS OR EVEN CONFLICT. THAT WOULD, HOWEVER, REQUIRE A LAUNCH INFRASTRUCTURE FAR MORE FLEXIBLE AND RESPONSIVE THAN THE ONE SUPPORTING US TODAY. IT MIGHT ALSO REQUIRE A PROLIFERATED NETWORK OF SIMPLIFIED CONTROL FACILITIES----A NUMBER OF WHICH COULD BE MOBILE----BUT THAT COULD SIGNIFICANTLY IMPROVE THE READINESS AND SUSTAINABILITY OF OUR SATELLITE TRACKING AND CONTROL NETWORKS.

I REALIZE THAT THE IDEA OF GENERIC BOOSTERS AND LAUNCH PADS, ON-ORBIT SPARES, AND PROLIFERATED CONTROL FACILITIES MAY NOT BE NEW. BUT, I AM CONVINCED THAT THE TIME HAS COME FOR US TO OBJECTIVELY EVALUATE THEM AS MEANS TO SATISFY OUR REQUIREMENTS IN CONFLICT.

TODAY'S SPACE SYSTEMS AND OPERATIONS PROVIDE TREMENDOUS SUPPORT TO OUR OPERATIONAL FORCES. IN SIMPLE TERMS, THEY PREVENT SURPRISE WHICH GIVES US AN EDGE TO WIN AND SAVES LIVES. THAT SUPPORT MAKES OUR LAND, SEA, AND AIR FORCES TOUGH TO BEAT. BUT, IF THOSE FORCES ARE GOING TO HAVE TO DO MORE WITH LESS, THEN WE MUST ENSURE THEY ARE SUPPORTED BY A ROBUST SPACE FORCE STRUCTURE----A FORCE STRUCTURE WHICH HAS BEEN DESIGNED, DEVELOPED, AND MODERNIZED TO PROVIDE THE DEGREE OF WARTIME CAPABILITY, READINESS, AND SUSTAINABILITY COMMENSURATE WITH ITS MILITARY VALUE, AND WHICH OUR OPERATIONAL COMMANDERS HAVE EVERY RIGHT TO EXPECT.

THERE ARE TWO THINGS I WOULD LEAVE YOU WITH. SOLZHENITSYN, WHEN HE WROTE HIS BOOK, GULOG ARCHIPELAGO, SAID ONE OF THE MOST POIGNANT THINGS OF ALL TIMES AND IT IS SOMETHING THAT WE TEND TO FORGET. HE SAID, "FREE MEN DON'T KNOW THE VALUE OF FAITH." WHAT HE MEANT THEN AND WHAT IS STILL TRUE TODAY IS THAT FREE MEN DON'T KNOW THE VALUE OF FREEDOM. I AM PLEASED TO SAY THERE ARE, HOWEVER, MANY IN THIS COMMUNITY AND THROUGHOUT OUR GREAT NATION THAT TRULY APPRECIATE THE VALUE OF OUR FREEDOM AND OUR WAY OF LIFE. THEY ARE DOING THEIR UTMOST TO PROTECT OUR FREEDOM.

AND LASTLY, I WOULD LEAVE YOU WITH THE WORDS OF PRESIDENT JOHN F. KENNEDY IN HIS INAUGURAL ADDRESS WHEN HE SAID, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG."

THANK YOU FOR INVITING ME HERE AND GOD BLESS YOU ALL.

GENERAL JOHN L. PIOTROWSKI
"552D KNUCKLEBUSTER BALL"
TINKER AIR FORCE BASE, OKLAHOMA
5 MARCH 1988

AFTER AN INTRODUCTION LIKE THAT, I HESITATE TO SAY ANYTHING. I HATE TO SPOIL A FAVORABLE IMPRESSION!

IT IS MY PLEASURE TO RETURN TO THE GREATER OKLAHOMA CITY AREA TO SPEND A COUPLE OF DAYS WITH PEOPLE WHO KNOW THE MEANING OF THE TERM "DEFENSE" AND HAVE A CLEAR IDEA ABOUT HOW THE MISSION OF THIS IMPORTANT BASE AND UNIT FITS INTO THE EQUATION OF NATIONAL SECURITY. ALLOW ME TO SAY UP FRONT THAT I ALWAYS TAKE PRIDE IN THE VERY SPECIAL RELATIONSHIP WHICH EXISTS BETWEEN THE MEN AND WOMEN OF TINKER AND THE PEOPLE OF THIS GREAT CITY. A LOT OF WATER HAS PASSED OVER THE DAM SINCE I LEFT THIS AREA IN 1979, BUT ONE THING REMAINS UNCHANGED----THE CLOSE MILITARY-CIVILIAN TIES WHICH EXTEND WELL BEYOND THE GATES OF THIS INSTALLATION.

AS YOU HAVE HEARD, SHEILA AND I ARE NOW IN THE NEIGHBORING STATE OF COLORADO AND PRIOR TO THAT WE WERE IN WASHINGTON----A GREAT CITY SURROUNDED ON ALL SIDES BY REALITY . . . YOU KNOW, HARRY TRUMAN USED TO

SAY THAT IF YOU WANTED A FRIEND IN WASHINGTON, YOU SHOULD BUY A DOG. BUT, ALL KIDDING ASIDE, I CAN ACCURATELY REPORT THAT YOUR SUPPORT AND YOUR CONTRIBUTIONS TO DEFENSE . . . AS A BASE AND UNIT . . . ARE LEGEND IN WASHINGTON.

BOTH SHEILA AND I REMEMBER OUR DAYS IN YOUR COMMUNITY WITH GREAT FONDNESS AND WHEN WE ARRIVED IN OUR QUARTERS YESTERDAY, WE WERE SURPRISED TO SEE THAT SOME OF YOU HAD REMEMBERED US. OUR FLIGHT IN WAS SOMEWHAT BUMPY DUE TO GUSTING WINDS AND GENERALLY UNSETTLED CONDITIONS . . . EVEN FOR A VETERAN AVIATOR LIKE ME. AND SURE ENOUGH WHEN WE FINALLY LANDED AND WERE ESCORTED TO OUR QUARTERS A COPY OF THE DAILY OKLAHOMAN HAD BEEN LEFT FOR US. AS I OPENED IT UP, THE HEADLINES WERE . . . "BIG WIND BLOWS INTO TOWN," . . . AND THEN RIGHT OFF TO THE RIGHT WAS ANOTHER COLUMN THAT SAID . . . "GENERAL PIOTROWSKI SPEAKS TO THE KNUCKLEBUSTER BALL." IT'S NICE TO BE REMEMBERED.

THAT WAS AN ABSOLUTELY DELICIOUS MEAL. MY THANKS TO OUR HOSTS AND I'M SURE ALL OUR COMPLIMENTS GO OUT TO THE CLUB FOR OUT DOING THEMSELVES THIS EVENING.

MY COMMAND SURGEON TELLS ME THAT OUR SENSE OF HEARING IS CONSIDERABLY DULLED BY EATING. IT'S NATURE'S WAY OF PROTECTING ALL OF YOU FROM AFTER-DINNER SPEAKERS. IF ANY OF YOU GET GROGGY WHILE I'M TALKING, I'LL BLAME IT ON THE LACK OF OXYGEN IN THE ROOM OR THE GREAT MEAL. BUT, REST ASSURED THAT IF YOU ALL STAY AWAKE AND LOOK ELECTRIFIED, I'M CERTAINLY WILLING TO TAKE THE FULL CREDIT.

BUT ON A MORE SERIOUS NOTE, JOINING YOU TONIGHT PROVIDES AN IDEAL OPPORTUNITY TO REUNITE WITH THIS GREAT UNIT, SEE SOME OLD FRIENDS AND TO MEET MANY NEW ONES, AND TO FOSTER THE RICH TRADITION OF THE DINING-OUT. ALSO, I WOULD BE REMISS IF I DIDN'T SAY CONGRATULATIONS AT THE VERY OUTSET. THE 522D AIRBORNE WARNING AND CONTROL WING HAS BEEN SELECTED TO REPRESENT TACTICAL AIR COMMAND IN THE 1987 DAEDALIAN COMPETITION. THAT IS A SUPERB ACCOMPLISHMENT----BUT I MUST SAY I AM NOT SURPRISED. IT'S JUST ANOTHER RAMIFICATION OF KNUCKLEBUSTER PRIDE, ENTHUSIASM, AND SKILL.

THE MAINTENANCE RESPONSIBILITIES ASSOCIATED WITH SUPPORTING AIRCRAFT AT KADENA, KEFLAVIK, DAVIS-MONTHAN, KEESLER, ELMENDORF, SAUDI ARABIA, AND HERE AT TINKER ARE AWESOME. I RECOGNIZE THAT AND SALUTE ALL YOU KNUCKLEBUSTERS FOR MAKING IT HAPPEN.

SINCE ALL OF YOU ARE ON THE HIGH WHICH RESULTS FROM SUCCESS AND ACHIEVEMENT, I'D LIKE TO TAKE YOU EVEN HIGHER----TO THE ULTIMATE HIGH GROUND OF SPACE.

THIS EVENING I'D LIKE TO SHARE SOME THOUGHTS WITH YOU ON THE CRITICAL SPACE ISSUES OF TODAY, AND PERHAPS MORE IMPORTANTLY, THE KINDS OF PROGRAMS I WOULD LIKE TO SEE US BRING ON LINE IN THE FUTURE.

TODAY, OUR LAND, SEA, AND AIR FORCES ARE HEAVILY DEPENDENT UPON SPACE-BASED SYSTEMS FOR COMMUNICATIONS, NAVIGATION, AND SURVEILLANCE. I BELIEVE THAT EVEN THE MOST CONSERVATIVE MILITARY PLANNER WOULD AGREE THAT THE UNIQUE ADVANTAGES OF OPERATING IN SPACE, COUPLED WITH THE STRATEGIC IMPORTANCE OF THAT MEDIUM, SUGGEST THAT FUTURE SUCCESS OR FAILURE IN COMBAT WILL TURN LARGELY ON HOW EFFICIENTLY AND EFFECTIVELY WE EMPLOY SPACE-BASED SYSTEMS.

BUT WHILE THE NATION HAS CHALKED UP A REMARKABLE LIST OF SUCCESSES IN SPACE DURING THE PAST FORTY YEARS, THERE IS AN EQUALLY IMPRESSIVE ARRAY OF CHALLENGES FACING US IN THE FUTURE. SOME OF THOSE CHALLENGES RESULT FROM THE FACT THAT OUR MAJOR ADVERSARY, THE SOVIET UNION, HAS RECENTLY CELEBRATED SOME SPACE SUCCESSES OF THEIR OWN WHICH WE REALLY CAN'T AFFORD TO IGNORE.

LAST OCTOBER WAS THE THIRTIETH ANNIVERSARY OF THE WORLD'S FIRST SPACE LAUNCH----SPUTNIK----WHICH THE SOVIETS FOLLOWED WITH MORE THAN 2,100 ADDITIONAL SPACE LAUNCHES. THAT IMPRESSIVE TOTAL IS BETTER THAN DOUBLE THE AMOUNT WE CAN CLAIM. ALSO, IN OCTOBER 1987 THE SOVIETS BROKE THEIR OWN RECORD OF 237 CONSECUTIVE MAN-DAYS IN SPACE. WITH COSMONAUTS ABOARD THEIR MIR SPACE STATION CONTINUOUSLY SINCE EARLY FEBRUARY 1987 . . . AND NO INDICATION THEY ARE PLANNING TO LEAVE----THEY ARE CLEARLY ON THEIR WAY TO ACHIEVING----OR HAVE ALREADY BEGUN----A PERMANENT MANNED PRESENCE IN SPACE.

MOST OF YOU ARE AWARE OF THE HEAVY MILITARY INFLUENCE WITHIN THE SOVIET SPACE PROGRAM. THEY LAUNCH ROUGHLY 100 TIMES A YEAR AND SUSTAIN AN ON-ORBIT INFRASTRUCTURE OF APPROXIMATELY 150 OPERATIONAL SATELLITES. THIS GIVES THEM A VERY ROBUST SERIES OF INTELLIGENCE, COMMUNICATIONS, AND NAVIGATION SYSTEMS WITH WHICH TO SUPPORT THEIR STRATEGIC AND TACTICAL FORCES. NEARLY 90 PERCENT OF THEIR SATELLITES HAVE MILITARY, OR MILITARY-RELATED MISSIONS, AND THE OTHER TEN PERCENT EXIST TO SUPPORT THE MILITARY SATELLITES. I'M ALSO HIGHLY SUSPICIOUS THAT THE MIR SPACE STATION IS INCLUDED IN THE CATEGORY OF MILITARY SPACECRAFT.

MOREOVER, THEY ARE EQUALLY BUSY TESTING NEW BOOSTER SYSTEMS WHICH CAN EITHER CARRY VERY HEAVY PAYLOADS TO LOW-EARTH ORBIT----PAYLOADS IN EXCESS OF 100 TONS----OR BE USED TO LAUNCH A SHUTTLE-TYPE VEHICLE.

ONE SERIOUS ASYMMETRY IN SPACE FORCES WHICH CONCERNS ME IS THAT THE SOVIETS HAVE SEVERAL ANTISATELLITE SYSTEMS, OPERATIONAL AND IN DEVELOPMENT, WHICH HAVE THE CAPABILITY TO THREATEN MANY OF OUR HIGHLY VALUABLE SATELLITES. THESE ASAT SYSTEMS INCLUDE DIRECT ASCENT MISSILES, "EXPERIMENTAL" LASERS, ELECTRONIC WARFARE SYSTEMS, AND A CO-ORBITAL KILLER SATELLITE WHICH HAS BEEN OPERATIONAL SINCE 1972. THE EXISTENCE OF THESE SYSTEMS, AND THEIR POTENTIAL FOR ASAT USES AND APPLICATIONS, GIVE THE SOVIETS NOTEWORTHY ADVANTAGES IN SPACE----ADVANTAGES IN THE PROTECTION OF THEIR OWN SPACECRAFT, AS WELL AS IN THE ABILITY TO DENY THE USE OF SPACE TO OTHER NATIONS DURING PERIODS OF CRISIS, TENSION, OR WARTIME.

OUR LACK OF CAPABILITY IN THIS AREA MEANS SIMPLY, THAT UNTIL SOME NECESSARY CHANGES ARE MADE TO OUR FORCE STRUCTURE, WE WILL NOT BE ABLE TO FULFILL THE DEMANDS OF THE SPACE CONTROL MISSION. SINCE THAT MISSION WILL VERY LIKELY BE THE KEY TO OUR FUTURE, AND

BECAUSE THE SOVIET THREAT IN SPACE IS FORMIDABLE, WE MUST PUT OURSELVES IN A POSITION TO ACCOMPLISH SPACE CONTROL IN THE SAME MANNER THAT WE HAVE PRACTICED SEA AND AIR CONTROL IN THE PAST.

A CORNERSTONE OF THE SPACE CONTROL MISSION IS KEEPING TRACK OF WHAT IS IN SPACE: MONITORING LAUNCHES, DETERMINING THE PROBABLE FUNCTION OF FOREIGN SPACECRAFT, AND MAINTAINING AN ACCURATE PICTURE OF WHAT IS IN ORBIT. COMPONENTS OF THE U.S. SPACE COMMAND, OPERATE A WORLDWIDE NETWORK OF SENSORS TO CARRY OUT THESE FUNCTIONS.

BUT THERE IS A GROWING NEED FOR IMPROVING OUR ABILITY TO CONDUCT SPACE SURVEILLANCE, SPECIFICALLY THE STEADY INCREASE IN THE NUMBER OF SPACECRAFT ON ORBIT, MOSTLY SOVIET; AND OUR LIMITED ABILITY FROM CERTAIN LONGITUDES, TO SURVEIL SOME OF THOSE SPACECRAFT, ESPECIALLY THOSE IN DEEP SPACE.

FORTUNATELY THIS IS AN EASY PROBLEM TO OVERCOME. A DEEP SPACE SURVEILLANCE RADAR WITH IMAGING CAPABILITIES COULD GREATLY EXPAND AND ENHANCE OUR SURVEILLANCE CAPABILITIES USING EXISTING TECHNOLOGIES AND PLACED IN THE APPROPRIATE GEOGRAPHIC AREA. A PROGRAM TO INSTALL SUCH A SYSTEM NEED NOT BE HIGH COST NOR REQUIRE A LONG LEAD TIME TO BRING TO OPERATIONAL STATUS.

RECOGNIZING THIS, THE DEFENSE RESOURCES BOARD HAS AGREED TO PROVIDE "START-UP" MONEY TO BEGIN THIS WORTHWHILE PROJECT.

WE ALSO NEED A SYSTEM IN SPACE WHICH CAN PROVIDE BETTER CAPABILITIES FOR DETECTING AND MONITORING THE THREATS U.S. LAND, SEA, AND AIR FORCES FACE IN THE TERRESTRIAL ENVIRONMENT. AMONG THOSE THREATS ARE A REJUVENATED SOVIET BOMBER FORCE ARMED WITH CRUISE MISSILES, SEVERAL VERSIONS OF MOBILE BALLISTIC MISSILES, A BLUE-WATER NAVY WHICH WILL SOON INCLUDE CONVENTIONAL AIRCRAFT CARRIERS, AND GROUND- AND SEA-LAUNCHED CRUISE MISSILE VARIANTS.

AS THESE THREATS BROADEN AND DIVERSIFY, IT IS EASY TO UNDERSTAND HOW ALL OF OUR UNIFIED COMMANDERS COULD BENEFIT FROM THE WIDE AREA SURVEILLANCE AND TRACKING CAPABILITIES THAT A SPACE-BASED RADAR (SBR) COULD PROVIDE.

AN SBR COULD BE DEVELOPED IN THE NEAR TERM FROM EXISTING TECHNOLOGIES AND AT RELATIVELY MODEST COST.

IT WOULD QUICKLY BECOME AN ESSENTIAL COMPONENT UPON WHICH OUR OPERATIONAL FORCES COULD RELY FOR EARLY WARNING BY ITS ABILITY TO DETECT THE BUILDUP OR MOVEMENT OF HOSTILE FORCES. SHOULD DETERRENCE FAIL AND HOSTILITIES RESULT, THE SBR WOULD ALSO SUPPORT

THEATER COMMANDERS WITH TIMELY TACTICAL INFORMATION. IT IS ANOTHER SYSTEM WHICH WE URGENTLY NEED, AND SHOULD FUND AND DEPLOY AT THE EARLIEST OPPORTUNITY.

IT ALSO GOES WITHOUT SAYING THAT WE NEED TO CORRECT THE DISADVANTAGE WHICH PRESENTLY EXISTS WITH REGARD TO ANTISATELLITE WEAPONRY. RECOGNIZING THE FACT THAT WE CANNOT AFFORD TO RELINQUISH THE HIGH GROUND OF SPACE TO THE SOVIETS, PRESIDENT REAGAN WROTE, QUOTE: "THE SPACE THREAT POSED BY THE SOVIET UNION IS GROWING MORE SERIOUS AS TIME GOES ON. I CANNOT LET THIS UNILATERAL SOVIET ADVANTAGE CONTINUE UNADDRESSED. AS PRESIDENT AND COMMANDER IN CHIEF OF OUR MILITARY FORCES, I AM PERSONALLY COMMITTED TO DEVELOPING AN OPERATIONAL U.S. ASAT WHICH WILL HELP PRESERVE THE SECURITY OF THE NATION AND OUR MEN AND WOMEN IN UNIFORM." UNQUOTE.

THE REAL QUESTION HERE BOILS DOWN TO: SHOULD WE DENY OUR PRESIDENT THE ABILITY TO DETER SOVIET AGGRESSION AGAINST OUR SPACECRAFT----WHICH ARE SOVEREIGN POSSESSIONS----BY NOT GIVING HIM THE OPTION OF RESPONDING IN KIND TO SOVIET USE OF AN ASAT WEAPON AGAINST US? I DON'T THINK IT'S RIGHT, OR SMART, TO PUT OUR NATION IN THE POSITION WHERE OUR ONLY OPTIONS IN SUCH A CASE WOULD BE EITHER TO RETREAT FROM SPACE, OR TO ESCALATE BY RESPONDING WITH SOME ACTION ON THE

LAND, IN THE AIR, OR AT SEA. YET, THE MONIES AVAILABLE TO FUND AN F-15 AIR LAUNCHED ASAT PROGRAMS, COUPLED WITH THE CONTINUATION OF THE CONGRESSIONAL MORATORIUM ON TESTING----MOSTLY THE LATTER----DROVE THE SECRETARY OF DEFENSE TO DECIDE TO TERMINATE THE PROGRAM.

IF WE CONTINUE TO ALLOW THE SOVIETS TO ENJOY THIS UNILATERAL ADVANTAGE IN SPACE, WE VIRTUALLY CONCEDE THE FACT THAT SHOULD HOSTILITIES EVER BREAK OUT, THEY COULD MAKE A DETERMINED EFFORT TO DOMINATE SPACE. BY NOT FULLY TESTING AND DEPLOYING OUR OWN ASAT, WE ARE CREATING A SANCTUARY IN SPACE FOR SOVIET SATELLITES WHICH ARE USED TO LOCATE AND TARGET OUR FORCES, WHILE U.S. AND ALLIED SPACECRAFT REMAIN VULNERABLE TO SOVIET ASAT ATTACKS. THIS CONCESSION TO THE SOVIETS WEAKENS OUR NATIONAL SECURITY AND, IN MY VIEW, IS NOT WHOLLY RESPONSIBLE.

I HAVE TOUCHED ON SOME SUBJECTS WHICH UNDERSCORE THE IMPORTANCE OF WHAT IS HAPPENING IN SPACE TODAY, AND HOW WE CAN BECOME BETTER PREPARED TO FULLY UTILIZE THE POTENTIAL OFFERED BY SPACE IN THE FUTURE. I AM CONFIDENT THAT REGARDLESS OF THE DIRECTION OUR NATION CHOOSES, OUR GRASP ON SPACE WILL BENEFIT FROM THE PROFESSIONALISM OF THE MEN AND WOMEN WHO ARE SERVING ON THE HIGH GROUND.

IN CONCLUSION, I OFFER CONGRATULATIONS TO THE 552D AND I TAKE THIS OPPORTUNITY TO THANK YOU FOR INCLUDING MY WIFE AND I IN YOUR "KNUCKLEBUSTER BALL." THESE EVENTS PROMOTE THE ESPRIT AND COHESIVENESS THAT ENABLE YOU AND AIR FORCE MAINTAINERS AROUND THE WORLD TO ACCOMPLISH THE DIFFICULT----WHILE STRIVING FOR THE IMPOSSIBLE.

THANK YOU.

GENERAL JOHN L. PIOTROWSKI
CHAMBER OF COMMERCE
PUEBLO, COLORADO
17 MARCH 1988

. . . AND THAT IS SO IMPORTANT TO ALL OF US AS A NATION AND CERTAINLY ALL OF US MILITARY LEADERS.

I WAS IN WASHINGTON DC YESTERDAY, INVITED BY CONGRESSMAN ASPIN, CHAIRMAN OF THE HOUSE ARMED SERVICES COMMITTEE. HE INVITED ALL OF THE FOUR-STAR GENERALS WHO COMMAND FORCES WORLDWIDE. THE COMMANDER IN CHIEF OF SOUTHERN FORCES FROM SOUTHERN COMMAND IN THE PANAMA CANAL; THE COMMANDER IN CHIEF OF THE EUROPEAN FORCES IN STUTTGART, GERMANY; THE COMMANDER IN CHIEFS OF THE PACIFIC AND THE ATLANTIC, STRATEGIC AIR COMMAND, TRANSPORTATION COMMAND, FORCES COMMAND, SPECIAL OPERATIONS COMMAND, AND CENTRAL COMMAND.

THE COMMITTEE ASKED US FOR OUR COMMENTS THAT WE THOUGHT WOULD BE OF INTEREST TO THE CONGRESS. AND I'M PROUD TO SAY THAT EACH AND EVERY ONE OF US STARTED OFF BY SAYING MY MAJOR CONCERN IS THAT THE CONGRESS IS NOT COMPENSATING OUR PEOPLE FOR THE COMMITMENT, THE WORK, AND THE SACRIFICES THEY MAKE. AND I HOPE THAT WASN'T LOST ON THEM, BECAUSE MILITARY

PEOPLE HERE IN PUEBLO, FORT CARSON TO THE NORTH, AND CERTAINLY ALL THE WAY TO CHEYENNE, WYOMING, WHERE THEY HAVE THE MX MISSILES, RICHLY DESERVE SUPPORT FROM THE CONGRESS FOR THE GREAT WORK THEY DO FOR THIS NATION.

THE OTHER POINT I WANT TO MAKE IS TO EXPRESS MY THANKS TO YOU, BECAUSE WE ARE JUST RECEIVING ABSOLUTELY WONDERFUL PEOPLE AND IT IS THE RESULT OF THE VALUES THAT YOU AND OTHERS LIKE YOU ACROSS THIS GREAT NATION OF OURS, INCULCATE ON OUR YOUNG PEOPLE.

WHAT I WOULD LIKE TO TALK BRIEFLY ABOUT TODAY IS THE ASYMMETRY BETWEEN THE U.S. AND THE SOVIET SPACE PROGRAM. THE DEPARTMENT OF DEFENSE SYSTEM IS DIFFERENT THAN THE NASA SPACE PROGRAM WHICH IS RESEARCH AND EXPLORATORY, AND FOR PEACEFUL PURPOSES. OF COURSE, THE DEPARTMENT OF DEFENSE PROGRAM IS FOR PEACEFUL PURPOSES TOO BECAUSE WHAT WE HOPE TO DO IS BY BEING STRONG WE WILL DETER SOVIET ADVENTURISM AND A THIRD WORLD WAR. SHOULD THAT OCCUR WE WANT TO BE IN A POSITION TO END THE CONFLICT QUICKLY ON TERMS FAVORABLE TO OUR NATION AND OUR ALLIES.

OUR DEPARTMENT OF DEFENSE SPACE PROGRAM IS SIGNIFICANTLY DIFFERENT THAN THE SOVIETS. ASYMMETRIES HAVE DEVELOPED AND I WANT TO SHARE THOSE WITH YOU BECAUSE YOU MAY, LIKE OTHERS, HAVE

READ ARTICLES IN TIME MAGAZINE AND NEWSWEEK MAGAZINE WHERE THE U.S. IS SAID TO BE "LOST IN SPACE." THESE WERE LARGELY TALKING ABOUT NASA'S RECOVERY FROM THE SHUTTLE DISASTER. AND, WHILE I'M NOT QUALIFIED TO SPEAK ON NASA, I'M FIRMLY CONVINCED THAT THEIR GET-WELL PROGRAM IS ON SCHEDULE AND WE'LL SEE THE SHUTTLE FLYING AGAIN THIS SUMMER----HOPEFULLY IN AUGUST AS THEY SUGGESTED.

WHEN SPUTNIK WAS LAUNCHED IN OCTOBER 1957, THE UNITED STATES RESPONDED QUICKLY PUTTING SYSTEMS IN SPACE. OUR TECHNOLOGY GAVE US THE ABILITY TO PUT IN VERY, VERY HIGH QUALITY SATELLITES THAT HAVE A LONG LIFE. THEY LAST FIVE, SIX, SEVEN YEARS----IN FACT, I BELIEVE THERE IS A SATELLITE IN ORBIT TODAY THAT HAS BEEN IN USE FOR OVER FIFTEEN YEARS. THE INFORMATION THAT THEY PROVIDE IS EXTENSIVE. THE WEATHER MAPS THAT YOU SEE NIGHTLY ON YOUR TELEVISIONS COME FROM SPACE SYSTEMS. THE COMMUNICATIONS THAT FLOW FROM NATIONAL AUTHORITIES LIKE THE PRESIDENT AND THE JOINT CHIEFS OF STAFF, TO THE FORCES AROUND THE GLOBE IN THE PERSIAN GULF AND ELSEWHERE TRAVEL REAL-TIME OVER SPACE SYSTEMS IN HIGH DATA RATES AND WITH FINE GRAIN QUALITY. AND IT'S DISTRIBUTED VERY QUICKLY. IT DOES THE JOB THAT WE NEED IT TO DO AND EXPECT IT TO DO AND DOES IT EXTREMELY WELL.

THE SOVIETS----ON THE OTHER HAND----LACKING THE TECHNOLOGY TO BUILD THE LONG-LIVED SATELLITES, BUILD VERY LARGE SPACE SYSTEMS AND LAUNCH ON VERY SHORT TIME LINES VERY OFTEN. SOVIET SATELLITES ARE CAPABLE OF DOING THE JOB THAT THEY WANTED THEM TO DO BUT ARE NOWHERE NEAR THE MATCH FOR AMERICAN TECHNOLOGY. AS A RESULT, WHAT WE SEE IN THE SOVIET UNION TODAY IS A MASSIVE SPACE INFRASTRUCTURE. TO GIVE YOU SOME NUMBERS: THEY HAVE TWICE THE NUMBER OF LAUNCH PADS, LAUNCH 15 TIMES THE NUMBER OF SATELLITES THAT WE DO, HAVE 2 MILLION POUNDS OF EXCESS LAUNCH CAPACITY AND HAVE DEMONSTRATED THE ABILITY TO LAUNCH SATELLITES VERY, VERY QUICKLY IN A CRISIS. FOR EXAMPLE, DURING THE FALKLANDS CONFLICT WHEN THE BRITISH FORCES MOVED INTO THE SOUTH ATLANTIC, THE SOVIETS LAUNCHED 28 SATELLITES IN 69 DAYS. NOW THOSE 28 SATELLITES ARE MORE THAN WE'VE LAUNCHED IN THREE YEARS. SO THEY HAVE THE ABILITY TO RAPIDLY GET INTO SPACE WITH THIS MASSIVE LAUNCH INFRASTRUCTURE. THEY HAVE FOUR TIMES THE PEOPLE IN THE SPACE BUSINESS AS WE DO. WHAT THIS MEANS IS THAT IF THEY DEVELOP A CAPABILITY TO KNOCK DOWN OUR SATELLITES, THEY HAVE A TREMENDOUS ADVANTAGE OVER THE UNITED STATES IN A PERIOD OF CONFLICT. THAT IS THE SITUATION THAT EXISTS TODAY.

AS THE COMMANDER OF SPACE FORCES, I HAVE BEEN TRYING FOR THE LAST YEAR TO CONVINCE THE CONGRESS THAT THIS NATION NEEDS TO FIELD A SYSTEM THAT HOLDS SOVIET SATELLITES AT RISK SO THAT THEY WOULD LEAVE OURS ALONE. AND I HAVE NOT YET BEEN SUCCESSFUL IN THAT QUEST.

THAT WAS THE SECOND MESSAGE I CARRIED IN AS THE COMMANDER IN CHIEF OF THE U.S. SPACE COMMAND TO THE HOUSE ARMED SERVICES COMMITTEE. I BELIEVE THAT IT IS EXTREMELY IMPORTANT TO THIS NATION. IT IS NOT THAT WE NEED THE CAPABILITY TO SHOOT DOWN SOVIET SATELLITES, BUT WE NEED A CAPABILITY TO HOLD THEIR SATELLITES AT RISK SO THEY WILL LEAVE OURS ALONE. IN THAT SITUATION, THE SYSTEMS THAT HAVE BEEN PAID FOR WITH YOUR TAXES THAT ARE SERVING OUR ARMED FORCES TODAY AND OUR NATIONAL LEADERSHIP CAN DO THE JOB WE EXPECT THEM TO DO AND SEE THAT THIS NATION CAN COME OUT OF ANY CONFLICT WITH THE EYES AND EARS, THE CAPABILITY AND COMMUNICATIONS THAT IT NEEDS TO ENSURE THAT A CONFLICT WOULD END QUICKLY ON TERMS FAVORABLE TO THE UNITED STATES. AND THAT OUR CHERISHED VALUES, OUR FREEDOMS, OUR WAY OF LIFE CAN CONTINUE.

AND I WOULD ASK FOR YOUR SUPPORT IN MAKING THAT MESSAGE CLEAR TO CONGRESS. WE'VE GOTTEN GOOD SUPPORT FROM THE COLORADO DELEGATION, SENATOR ARMSTRONG, CONGRESSMAN HEFLEY, AND OTHERS. THERE

ARE SOME WHO ARE NOT SO SUPPORTIVE. THE ISSUE SEEMS TO BE, DO THE SOVIETS HAVE A VIABLE SYSTEM OF KNOCKING OUR SATELLITES DOWN? THE ANSWER IS YES. THEY NOT ONLY HAVE ONE, BUT THEY HAVE SEVERAL. SO THE THREAT IS REAL AND CLEAR.

THERE ARE A COUPLE OF ARGUMENTS AGAINST DOING SOMETHING ABOUT DEVELOPING A CAPABILITY OF OUR OWN. ONE OF THEM IS, WE SHOULDN'T MILITARIZE SPACE WHICH IS A RATHER SPECIOUS, SILLY ARGUMENT BECAUSE THE GERMANS MILITARIZED SPACE WHEN THEY LAUNCHED THE FIRST V-2 ROCKET. EVER SINCE THEN, WHEN WE'VE USED SATELLITES FOR MILITARY COMMUNICATIONS, SURVEILLANCE, OR WEATHER, WE ARE USING SPACE TO SUPPORT OUR MILITARY NEEDS.

THE OTHER ARGUMENT IS THAT IF WE DON'T DEVELOP A SYSTEM, OR DON'T TEST THE SYSTEM, THE SOVIETS WON'T TEST THEIRS EITHER. THE TRUTH OF THE MATTER IS THAT THEIR SYSTEMS ARE OPERATIONAL, THEY DON'T NEED TO BE TESTED, AND THEY HAVE MORE THAN ONE. IT IS MY HIGHEST PRIORITY TO DEFEND OUR SPACE SYSTEMS AND ENSURE THAT OUR FORCES HAVE THE NECESSARY INFORMATION THAT THEY NEED TO SURVIVE, TO FIGHT, AND TO WIN.

I HOPE I ADHERED TO MY OPENING PROMISE OF BREVITY. YOU KNOW ONE OF THE GREATEST COMMENTS ABOUT BEING BRIEF WAS WHAT HENRY THE EIGHTH SAID TO ONE OF HIS SEVERAL WIVES, WHEN HE SAID . . . "I WON'T KEEP YOU LONG." I HOPE I HAVEN'T KEPT YOU LONG.

THERE ARE TWO THINGS I WOULD LEAVE YOU WITH. SOLZHENITSYN WHEN HE WROTE HIS BOOK, GULOG ARCHIPELAGO, SAID ONE OF THE MOST POIGNANT THINGS OF ALL TIMES AND IT IS SOMETHING THAT WE TEND TO FORGET. HE SAID, "FREE MEN DON'T KNOW THE VALUE OF FAITH." WHAT HE MEANT THEN AND WHAT IS STILL TRUE TODAY IS THAT FREE MEN DON'T KNOW THE VALUE OF FREEDOM. I AM PLEASED TO SAY THERE ARE, HOWEVER, MANY IN THIS COMMUNITY AND THROUGHOUT OUR GREAT NATION THAT TRULY APPRECIATE THE VALUE OF OUR FREEDOM AND OUR WAY OF LIFE. THEY ARE DOING THEIR UTMOST TO SUPPORT OUR FREEDOM THAT INCLUDES ALL THOSE GREAT YOUNG MEN AND WOMEN IN UNIFORM I TALKED ABOUT EARLIER.

AND LASTLY, I WOULD LEAVE YOU WITH THE WORDS OF PRESIDENT JOHN F. KENNEDY IN HIS INAUGURAL ADDRESS WHEN HE SAID, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG."

GOD BLESS YOU ALL. THANK YOU FOR INVITING ME HERE AND GOD BLESS PUEBLO.

GENERAL JOHN L. PIOTROWSKI
NAVAL SPACE COMMAND - CHANGE OF COMMAND
DAHLGREN, VIRGINIA
21 MARCH 1988

ADMIRAL AND MRS MACKE, ADMIRAL AND MRS FROST, FELLOW FLAG AND GENERAL OFFICERS, DISTINGUISHED GUESTS, MEN AND WOMEN OF THE NAVAL SPACE COMMAND, LADIES AND GENTLEMEN.

AS STATED IN THE SCRIPTURES, THERE IS A TIME FOR ALL THINGS----A TIME TO PLANT AND A TIME TO HARVEST. LIKEWISE IN THE MILITARY THERE IS A TIME TO COME AND A TIME TO MOVE ON, AND TODAY MARKS ONE OF THOSE SPECIAL DAYS IN THE LIVES OF TWO SUPERB NAVAL LEADERS AND THEIR FAMILIES.

A CHANGE OF COMMAND ALWAYS EVOKES STRONG FEELINGS AND POWERFUL EMOTIONS----A SENSE OF PRIDE IN ACCOMPLISHMENT AND IN UNIT ESPRIT ON THE PART OF ALL CONCERNED . . . A FEELING OF SADNESS IN LEAVING CLOSE FRIENDS AND TRUSTED COMRADES WHO HAVE REPEATEDLY GONE THE EXTRA MILE . . . A SENSE OF REGRET FOR THE CHALLENGES YET UNRESOLVED . . . AND, AN OVERWHELMING FEELING OF COMMITMENT, AS THE MANTLE OF RESPONSIBILITY FALLS ON ONE'S SHOULDERS.

THOSE FEELINGS, AND MORE, ARE ABUNDANT TODAY, AS WE PAUSE TO BID "FAREWELL" AND SAY "THANK YOU" TO REAR ADMIRAL DICK MACKE----A CONSUMMATE PROFESSIONAL----FOR HIS VISION AND LEADERSHIP ON BEHALF OF THE FLEET NAVY AND MARINE FORCES . . . AND ALSO TO WELCOME ADMIRAL DAVE FROST----AN OUTSTANDING OFFICER AND LEADER----AS THE NEW COMMANDING OFFICER OF THE NAVAL SPACE COMMAND.

IT IS NOW----AND WILL REMAIN----A REALITY: THAT SEA POWER IS DEPENDENT ON SPACE POWER. AS ADMIRAL TROST SAID HERE LAST OCTOBER, QUOTE: "SPACE IS INDISPENSABLE TO THE SUCCESSFUL EXECUTION OF OUR MARITIME STRATEGY, FOR OUR NAVY WHOSE OPERATING ENVIRONMENT COVERS THREE QUARTERS OF THE SURFACE OF THE WORLD." UNQUOTE. THAT BRINGS US BACK TO THE EVENTS OF TODAY.

THE NAVY HAS A STRONG TRADITION OF PLACING THE BEST WARFIGHTERS AT THE HELM----WHETHER ASHORE, OR UNDERWAY. BOTH DICK MACKE AND DAVE FROST HAVE SPENT A GOOD PART OF THEIR LIVES AT SEA----HONING THEIR TACTICAL SKILLS. THAT TRANSITION OF CAREER WARFIGHTERS INTO POSITIONS OF NAVAL LEADERSHIP ASHORE, RESULTS IN IMMEASURABLE BENEFIT TO THE FLEET, BY ENSURING THE MOST CRITICAL REQUIREMENTS ARE IDENTIFIED AND TRANSLATED INTO REALISTIC PROGRAMS.

WE WILL CONTINUE TO RELY ON THIS OPERATIONAL EXPERTISE FOR ADVOCACY OF THE MOST URGENT SPACE NEEDS OF THE TACTICAL COMMANDER.

AND SO, TO ADMIRAL MACKE, LET ME SAY THAT YOU WILL REAP THE FRUITS OF YOUR RECENT LABORS ON THE DECK OF YOUR FLAGSHIP. YOUR EFFORTS HAVE PROVIDED CRITICAL SUPPORT TO THE FLEET, BY BUILDING A FOUNDATION WHICH WILL, IN TURN, SUPPORT YOU AS YOU COMMAND THE CARRIER GROUP. ALL OF US WITHIN THE U.S. SPACE COMMAND FAMILY, THANK YOU FOR A JOB WELL DONE, AND WISH YOU AND BARBARA "FAIR WINDS AND FOLLOWING SEAS" AS YOU MOVE JUST DOWN THE ROAD TO NORFOLK.

TO ADMIRAL FROST, LET ME SAY THAT YOU AND THE NAVAL SPACE COMMAND HAVE THE POTENTIAL TO INFLUENCE THE SUPERIORITY OF OUR NAVAL FORCES----AND THE PROBABILITY OF THEIR SUCCESS----BY THE INTEGRATION OF SPACE SYSTEMS INTO THE OPERATIONS OF OUR MARITIME FORCES. YOUR BACKGROUND IN COMBAT OPERATIONS . . . OPNAV . . . THE TRAINING COMMAND . . . AND AS THE COMMANDING OFFICER OF SEVERAL SQUADRONS AND AFLOAT COMMANDS . . . WILL SERVE YOU WELL HERE AT DAHLGREN.

FOR HERE, YOU WILL FIND YOURSELF CONSTANTLY DRAWING ON THAT EXPERIENCE, TO REPRESENT THE BEST INTERESTS OF THE MARITIME FORCES IN THE DEVELOPMENT OF COMBINED ARMS DOCTRINE . . . SYSTEM EXPLOITATION . . . AND DEFINITION OF REQUIREMENTS. THE CHALLENGES ARE GREAT, AND I AM FULLY CONFIDENT THAT YOU WILL MEET THEM. TO YOU AND MARJORIE, LET ME SAY----WELCOME ABOARD.

GENERAL JOHN L. PIOTROWSKI
ACTIVATION REMARKS
ARSPACECOM
COLORADO SPRINGS, COLORADO
7 APRIL 1988

GENERAL VUONO, COLONEL THURSTON, MEN AND WOMEN OF THE ARMY SPACE COMMAND, DISTINGUISHED GUESTS, LADIES AND GENTLEMEN, PATRIOTS ALL. A WARM WELCOME TO ALL OF YOU TO THIS HISTORIC EVENT. IT IS INDEED A GREAT DAY FOR U.S. SPACE COMMAND, FOR THE UNITED STATES ARMY, AND FOR OUR GREAT NATION! INDEED THE SPACE COMMUNITY . . . SHOULD BE PROUD OF THE EFFORTS WHICH HAVE CULMINATED IN TODAY'S COLORFUL CEREMONY.

I WANT TO PERSONALLY THANK GENERAL VUONO WHO HAS TAKEN THE TIME TO PARTICIPATE IN THIS EVENT. AS GENERAL VUONO HAS INDICATED, THE ARMY IS STEEPED IN SPACE HISTORY. CERTAINLY, THE ROAD FROM BOOSTING AMERICA'S FIRST SATELLITE INTO SPACE, TO THE FORMATION OF THIS COMMAND TODAY, HAS BEEN A SPACE PATH MARKED BY DISTINGUISHED ACCOMPLISHMENTS AND VALUED CONTRIBUTIONS.

AS THE ARMY SPACE COMMAND BECOMES A REALITY, THE WORDS OF A GREAT AMERICAN SOLDIER . . . GENERAL DOUGLAS MacARTHUR COME TO MIND, QUOTE: "ON THE FIELDS OF FRIENDLY STRIFE ARE SOWN THE SEEDS WHICH ON OTHER DAYS AND OTHER FIELDS WILL BEAR THE FRUITS OF VICTORY." UNQUOTE. THE SEEDS PLANTED HERE TODAY IN THE ESTABLISHMENT OF THE U.S. ARMY SPACE COMMAND WILL BEAR MUCH FRUIT, NOT ONLY IN THE EVENT OF HOSTILITIES, BUT ALSO IN PEACE.

TODAY, HERE IN THIS HANGAR, THE ARMY HAS TAKEN ANOTHER STEP IN A SERIES OF HISTORICALLY MONUMENTAL STRIDES, TO ENSURE THAT ON THE BATTLEFIELD OF TOMORROW, U.S. FORCES WILL PRODUCE VICTORY. THE NEW "HIGH GROUND" OF SPACE WILL CONTINUE TO ENHANCE THE WARFIGHTING ABILITY OF OUR AMERICAN GROUND, SEA, AND AIR FORCES WORLDWIDE.

THE SOLDIER WHO HAS AS ONE OF HIS MANY CLICHES----"MOVE, SHOOT, AND COMMUNICATE" CAN NOW LOCATE THE ENEMY, FIX HIS OWN POSITION AFTER MOVING, AND COMMUNICATE BY SATELLITE. AND THE RESEARCH AND DEVELOPMENT COMMUNITY IS PRESENTLY WORKING ON THE NATIONAL AEROSPACE PLANE WHICH HAS THE POTENTIAL TO TRANSPORT THE SOLDIER ACROSS CONTINENTS AND OCEANS IN TENS OF MINUTES. BY AND LARGE, THE GLOBAL ACCESS

THAT SPACE PROVIDES IS ESSENTIAL TO PROVIDING OUR FORWARD DEPLOYED COMMANDERS THE INFORMATION THAT THEY NEED TO DO THEIR JOB MORE QUICKLY, MORE EFFECTIVELY, AND WITH LOWERED RISK FOR THE SOLDIER, SAILOR, AIRMAN, AND MARINE IN BATTLE.

COLONEL THURSTON AND HIS TROOPS----THE FOUNDING FATHERS OF THE ARMY'S SPACE COMMAND----WILL MAKE THAT HAPPEN FOR OUR GROUND FORCES. THIS CEREMONY . . . THE ACTIVATION OF THE U.S. ARMY SPACE COMMAND . . . IS IN ITSELF, THE ACKNOWLEDGMENT OF THE IMPORTANCE OF SPACE TO THE ARMY AND TO OUR NATION. I SALUTE ALL OF YOU ASSEMBLED HERE AND LOOK FORWARD TO MOVING AHEAD WITH THE NEW U.S. ARMY SPACE COMMAND----AND I WELCOME THE COMMAND AS A FULL FLEDGED COMPONENT OF U.S. SPACE COMMAND AND TAKE ITS RIGHTFUL PLACE ALONGSIDE THE AIR FORCE AND NAVY COMPONENTS.

GOD BLESS.

GENERAL JOHN L. PIOTROWSKI
WELCOMING REMARKS OUTLINE
AIR DEFENSE MODERNIZATION SENIOR OPERATIONS REQUIREMENTS REVIEW GROUP (ADMSORRG)
COLORADO SPRINGS, COLORADO
7 APRIL 1988

- PLEASED TO FORMALLY WELCOME YOU TO COLORADO SPRINGS AND THE SEVENTH MEETING OF THE ADMSORRG

- MUST MENTION HOW GOOD IT FEELS TO WITNESS A RESURGENCE IN THE AEROSPACE DEFENSE BUSINESS

  -- AND TO RENEW SOME OLD ACQUAINTANCES

  -- EQUALLY PLEASED TO SEE NEW FACES

    --- NEW PEOPLE BRING NEW IDEAS

    --- NEW IDEAS ARE ESSENTIAL TO INNOVATION

    --- INNOVATION IS NECESSARY FOR ANY SUCCESS-ORIENTED OPERATION

- REALIZE THAT MY ROLE THIS MORNING IS TO OFFER WELCOME REMARKS

  - BUT WE GATHER SO INFREQUENTLY THAT I'D LIKE TO SHARE A FEW QUICK THOUGHTS

- WE'RE IN A TOUGH BUSINESS AND IN TOUGH TIMES

  - CRITICAL NATURE OF MISSION

  - THREAT KEEPS MAKING JOB TOUGHER

  - OUR FORCES TO COUNTERTHREAT REMAIN LEAN

  - ZERO GROWTH ENVIRONMENT

  - IMPERATIVE THAT WE MAXIMIZE ELASTICITY OF EVERY DOLLAR

- THE NORTH AMERICAN AIR DEFENSE MODERNIZATION HAS HELPED US CHART OUR COURSE

  - NOT ONLY HAVE THE MODERNIZATION COMPONENTS BEEN IDENTIFIED . . .

  - BUT, WE HAVE ESTABLISHED A BASIS FOR FUTURE COOPERATION BETWEEN OUR TWO COUNTRIES REGARDING RESEARCH AND DEVELOPMENT OF TECHNOLOGY (INCLUDING SPACE-BASED SYSTEM TECHNOLOGIES) CONSISTENT WITH OUR AGREEMENT

- THE MAJOR COMPONENTS OF THE NAADM WILL SERVE TO MOVE US EFFICIENTLY TOWARD THE 21st CENTURY
  - YOUR AGENDA THIS MORNING IS PACKED WITH STATUS REPORTS ON MOST OF THOSE PROGRAMS
- BUT THERE ARE MANY OTHER AREAS WHICH ALSO DEMAND OUR ATTENTION:
  - FOR EXAMPLE . . . LONG-RANGE COMMUNICATION
  - WHAT ARE WE DOING TO OVERCOME POLAR CAP ABSORPTION AND THE AURORAL CURTAIN? IS EHF SATELLITE TECHNOLOGY THE ANSWER?
  - ARE WE MAKING ANY PROGRESS IN ADAPTIVE HF CONCEPT STANDARDIZATION? OR, IS CANADA GOING ONE WAY, THE U.S. ANOTHER WAY, AND NORAD IN THE MIDDLE.
- THESE PROBLEMS LIE IN FRONT OF US AND WE HAVE ONLY JUST BEGUN
- YOUR CHARTER AS A GROUP IS THREEFOLD
  - FIRST, MAKE SURE THE OPERATIONAL REQUIREMENTS ARE COMPREHENSIVE

  - SECOND, ENSURE THE ACQUISITION IS IN LINE WITH THE REQUIREMENTS

  - FINALLY, BRING IT ALL ON-LINE EXPEDITIOUSLY

- WE ARE FACED WITH OBVIOUS CHALLENGES

- CHALLENGES ALSO CONSTITUTE OPPORTUNITIES

- THIS GROUP HAS DEMONSTRATED THAT IT POSSESSES THE TALENTS AND EXPERIENCE TO HELP MOVE NORAD FORWARD

- I'M CONFIDENT THAT AS A GROUP AND WITHIN OUR RESPECTIVE CORNERS OF THE COMMAND WE'LL SCORE OUR SHARE OF SUCCESSES

- AGAIN . . . WELCOME

- WORK HARD

- HOPE THE MEETING GOES WELL

GENERAL JOHN L. PIOTROWSKI
NATIONAL ASSOCIATION OF PRO-AMERICA
COEUR d'ALENE, IDAHO
1 MAY 1988

IT IS A PLEASURE TO SPEAK TO A GROUP WHICH IS ALREADY VERY WELL-INFORMED ON DEFENSE ISSUES, AND ONE WHICH ACTIVELY CULTIVATES AN AWARENESS OF THOSE ISSUES IN OTHERS. THIS EVENING, I INTEND TO DO ONLY TWO THINGS. FIRST, TO EXPLAIN TO YOU THE NEED FOR A UNITED STATES' SATELLITE NEGATION, OR ANTISATELLITE SYSTEM. SECOND, TO ASK THAT YOU MAKE OTHERS AWARE OF THIS CRITICAL----AND UNMET----NATIONAL SECURITY REQUIREMENT.

LET ME BEGIN BY MAKING AN ASSERTION, AND THEN EXPLAINING IT. THE ASSERTION IS THIS: "MASTERY OF SPACE IS A PREREQUISITE FOR VICTORY IN WAR." MASTERY OF SPACE IS A PREREQUISITE FOR VICTORY IN WAR. TO A MILITARY OFFICER WHO KNOWS SOMETHING ABOUT SPACE, THAT STATEMENT MEANS THAT SUCCESS ON THE GROUND, AT SEA, AND IN THE AIR, IS DEPENDENT ON THE CONTROL----OR MASTERY----OF SPACE.

FROM A MILITARY PERSPECTIVE, I MUST ADMIT THAT THE ASSERTION MAKES VERY GOOD SENSE. YET, I MUST ALSO CONFESS THAT I FIND IT TROUBLING. I FIND IT TROUBLING, BECAUSE IT IS A PRINCIPLE FOUND IN SOVIET MILITARY DOCTRINE.

IT IS NOT TROUBLING JUST BECAUSE THE SOVIETS SAID IT, NOR IS IT WORRISOME BECAUSE THE SOVIETS BELIEVE IT TO BE TRUE. WHAT IS TROUBLING ABOUT IT, IS THAT THE SOVIETS HAVE STRUCTURED THEIR SPACE FORCES TO MAKE THAT ASSERTION A REALITY----WHATS WORSE, OUR OWN COUNTRY HAS DONE LITTLE TO STOP THEM FROM MASTERING SPACE IN A CRISIS OR A CONFLICT. I DON'T CONSIDER MYSELF A NERVOUS PERSON, OR ONE WHO IS EASILY FRIGHTENED, BUT I'VE GOT TO ADMIT TO YOU, THAT I AM CONCERNED----VERY CONCERNED----THAT WE FIND OURSELVES IN A POSITION WHERE IN CRISIS OR CONFLICT WE HAVE DELIBERATELY CONCEDED CONTROL OF SPACE TO THE SOVIET UNION.

LET ME REVIEW SOME FACTS WITH YOU. THE SOVIETS HAVE THE LARGEST, MOST RESPONSIVE, MOST FLEXIBLE, AND BEST EXERCISED LAUNCH INFRASTRUCTURE IN THE WORLD. THEY HAVE THREE LARGE LAUNCH COMPLEXES AND TWICE AS MANY LAUNCH PADS AS WE DO. SINCE 1957 THEY'VE CONDUCTED MORE THAN TWICE AS MANY SPACE LAUNCHES AS WE HAVE. FOR THE LAST SEVERAL YEARS, THEY'VE

CONDUCTED ON THE AVERAGE OF FIVE TIMES AS MANY SPACE LAUNCHES EACH YEAR. THEY GO AT IT SIX DAYS A WEEK, WITH EIGHT DIFFERENT KINDS OF LAUNCH BOOSTERS. WHILE WE CAN COUNT THE NUMBER OF ANNUAL U.S. LAUNCHES FOR EACH YEAR OVER THE LAST TWO YEARS ON THE FINGERS OF TWO HANDS, MOST MONTHS IT TAKES MORE THAN TWO HANDS TO COUNT UP SOVIET SPACE ACTIVITY.

THE SOVIETS HAVE MORE SATELLITES ON ORBIT THAN WE DO. AT LEAST 90 PERCENT OF THEIR SATELLITES ARE MILITARY SATELLITES, OR SUPPORT MILITARY OPERATIONS.

THEY'VE ACCUMULATED MORE THAN THREE TIMES AS MUCH MANNED SPACEFLIGHT EXPERIENCE AS WE HAVE. THEY HAVE THE WORLD'S ONLY PERMANENT SPACE STATION; THEIR COSMONAUTS HOLD THE RECORD FOR LONG DURATION SPACEFLIGHT, THEY RESUPPLY THEIR SPACE STATION WITH UNMANNED CARGO LAUNCHES. IMAGINE CONDUCTING A SPACE LAUNCH JUST TO DELIVER SUPPLIES, MAIL, AND CLEAN UNDERWEAR TO COSMONAUTS! THE SOVIETS DO IT.

THE SOVIETS ALSO HAVE SEVERAL UNIQUELY DESIGNED SATELLITES WHOSE ONLY PURPOSE IS TO LOCATE AND TARGET THE MILITARY FORCES OF THE UNITED STATES AND OUR ALLIES----THE RADAR OCEAN RECONNAISSANCE SATELLITE AND THE ELECTRONIC INTELLIGENCE OCEAN RECONNAISSANCE

SATELLITE. THESE SYSTEMS ARE USED TO LOCATE AND TRACK NAVAL FORCES. IN A CRISIS, THEY WOULD ALSO PASS ON THIS POSITION DATA, IN NEAR REAL-TIME, TO SOVIET COMBATANTS ARMED WITH LONG-RANGE STANDOFF WEAPONS.

BUT ALL OF THIS IS NOT TO SAY THAT THE SOVIETS ARE THE UNCHALLENGED MASTERS OF SPACE IN PEACETIME. ON A SYSTEM-FOR-SYSTEM BASIS, I BELIEVE OUR SATELLITES ARE SUPERIOR. THEY'RE MORE COMPLEX, AND DO WHAT THEY DO FASTER, MORE ACCURATELY, AND AT GREATER RATES THAN SOVIET SATELLITES. THEY ALSO LAST MUCH LONGER.

IN PEACETIME, I ASSESS THAT A ROUGH PARITY IN ON-ORBIT FORCES EXISTS----OUR CONSTELLATIONS MEET OUR NEEDS AND THE SOVIET CONSTELLATIONS DO THE SAME. MY CONCERN DOESN'T EMERGE FROM PEACETIME CONSIDERATIONS. IT EMERGES FROM STUDYING AND ANALYZING WHAT WILL HAPPEN IN STRESSFUL TIMES----IN CRISIS OR CONFLICT.

TODAY, SOVIET MASTERY OF SPACE IN CRISIS OR CONFLICT IS VIRTUALLY ASSURED. IT IS VIRTUALLY ASSURED BECAUSE THE SOVIETS HAVE SPACE CONTROL OR ANTISATELLITE WEAPONS, AND WE DO NOT.

THE SOVIETS HAVE, IN FACT, FOUR DIFFERENT KINDS OF TECHNOLOGIES THAT THEY COULD EMPLOY TO "MASTER SPACE." THEY HAVE A CONVENTIONALLY-ARMED WARHEAD LAUNCHED ON THE SL-11 BOOSTER----THEIR MOST RELIABLE BOOSTER, THEIR MILITARY "WORKHORSE." THEY HAVE TESTED THIS SYSTEM TO ENSURE ITS RELIABILITY AND, BELIEVE ME, IT CAN DO THE JOB. IT WORKS BY FLYING IN THE SAME ORBIT AS THE VICTIM SATELLITE. IT CLOSES ON ITS TARGET, AND WHEN IT GETS WITHIN "KILL" RANGE, THE WARHEAD DETONATES----SHOOTING THOUSANDS OF PELLETS THROUGH THE VICTIM. THAT SYSTEM HAS BEEN OPERATIONAL SINCE 1972.

THEY ALSO HAVE SYSTEMS THAT WE CALL DIRECT ASCENT WHICH KILL BY FLYING FROM THE EARTH DIRECTLY TO THE TARGET SATELLITE. THE SOVIETS' "GALOSH" ANTIBALLISTIC MISSILES, AND EVEN SOME OF THEIR INTERCONTINENTAL BALLISTIC MISSILES----ICBMs----HAVE "INHERENT" ANTISATELLITE CAPABILITIES.

ADD TO THAT TWO HIGH-POWERED LASERS AT A PLACE CALLED "SARY SHAGAN". THESE LASERS ARE PROBABLY CAPABLE OF DAMAGING SOME OF OUR LOW-EARTH ORBITING SATELLITES.

WE CAN ADD TO THAT THE TECHNOLOGICAL CAPABILITY OF ELECTRONIC WARFARE. I, FOR ONE, WAS NOT VERY SURPRISED TO HEAR SOVIET OFFICIALS OPENLY DISCUSSING ELECTRONIC WARFARE AS A POTENTIAL "ASYMMETRIC RESPONSE" TO SDI. SOVIET ELECTRONIC WARFARE CAPABILITIES CAN SUPPORT LAND, SEA, AND AIR WARFARE. SO WHY WOULDN'T THE SOVIETS ALSO USE SOMETHING SIMILAR TO SUPPORT SPACE WARFARE?

BUT IT DOESN'T END THERE. THE SOVIETS ARE ALSO KNOWN TO BE WORKING ON RADIO FREQUENCY OR "RF" WEAPONS, PARTICLE BEAM WEAPONS, AND OTHER ANTISATELLITE TECHNOLOGIES. IT WOULD NOT EVEN SURPRISE ME IF THE SOVIET SPACE SHUTTLE WERE DESIGNED WITH SOME "MASTERY OF SPACE" TASKS IN MIND.

I DO NOT BELIEVE A NATION CAN WIN A WAR, JUST BECAUSE IT MASTERS SPACE. WARS INVOLVE THE SUCCESSFUL EMPLOYMENT OF COMBINED ARMS AND SUPPORT IN FOUR ARENAS----ON LAND, AT SEA, IN THE AIR, AND IN SPACE. BUT I DO BELIEVE A NATION CAN LOSE A WAR BECAUSE IT WAS DRIVEN FROM SPACE.

WE KNOW, FOR EXAMPLE, THAT UNITED STATES' NAVAL SUPERIORITY IS ESSENTIAL, BECAUSE OURS IS REALLY AN ISLAND NATION. A BIG ISLAND, BUT AN ISLAND NONETHELESS. EARTH----OUR PLANET----IS ALSO AN ISLAND . . . AN ISLAND IN SPACE.

IF NEAR-EARTH SPACE IS CONTROLLED BY THE SOVIETS IN WARTIME, IT WILL BE EXTREMELY DIFFICULT----IN FACT, IT WILL PROBABLY BE IMPOSSIBLE----FOR US TO PREVAIL ON THE LAND, AT SEA, AND IN THE AIR.

OUR MILITARY FORCES DEPEND ON SPACE SYSTEMS FOR NAVIGATION SUPPORT, COMMUNICATIONS RELAY, WARNING, AND SURVEILLANCE OF ALL KINDS. WITHOUT THAT SPACE-BASED SUPPORT, WE WOULD BE EXTREMELY HARD-PRESSED TO FIGHT EFFECTIVELY ON THE LAND, AT SEA, OR IN THE AIR. AND THE ONLY WAY TO PRESERVE THAT SPACE-BASED SUPPORT----TO KEEP THE SOVIETS FROM MASTERING SPACE IN A CRISIS OR CONFLICT----IS TO POSSESS OUR OWN ROBUST, OPERATIONAL SATELLITE NEGATION SYSTEM.

WHY DON'T WE HAVE ONE? THERE ARE MANY REASONS, BUT THE MAIN REASON IS THAT CONGRESS HAS PASSED A LAW FORBIDDING US FROM TESTING THE ONE SYSTEM WE HAD IN DEVELOPMENT, AGAINST TARGET OBJECTS IN SPACE. BECAUSE WE WERE FORBIDDEN FROM TESTING OUR SYSTEM, SECRETARY OF DEFENSE CARLUCCI VERY PROPERLY TERMINATED FUNDING FOR THE PROGRAM. THE ABSOLUTE NEED FOR A SATELLITE NEGATION SYSTEM DID NOT GO AWAY, BUT----FACED WITH A PUBLIC LAW PROHIBITING TESTING----IT WOULD HAVE BEEN FISCALLY IRRESPONSIBLE FOR US TO CONTINUE WATERING A SEED, THAT CONGRESS HAD DECREED WOULD NEVER GROW INTO AN OPERATIONAL CAPABILITY.

WHY DID CONGRESS PROHIBIT TESTING? FIRST OF ALL, WE MUST RECOGNIZED THAT CONGRESS IS ALL OF US. IF, AS A NATION, WE WERE IGNORANT OF THE NEED FOR A SATELLITE NEGATION CAPABILITY----OR IF WE REALIZED THE NEED, BUT WERE TOO APATHETIC TO LET OUR LAWMAKERS KNOW OUR VIEWS----THEN THIS NEED LIKELY BECAME SUBMERGED IN THE THOUSANDS OF OTHER IMPORTANT THINGS OUR CONGRESS CONSIDERS EACH SESSION.

IF IGNORANCE WAS THE PROBLEM, THEN WE IN UNIFORM FAILED IN OUR OBLIGATION TO EDUCATE. IF APATHY WAS THE PROBLEM, THEN ALL OF US HAVE FAILED. I CAME HERE TONIGHT TO LAY OUT THE FACTS FOR YOU, TO ANSWER YOUR QUESTIONS, SO THAT YOU CAN FORM YOUR OWN JUDGMENTS, AND----AS CITIZENS----DETERMINE YOUR OWN COURSES OF ACTION.

LET ME SUMMARIZE MY ARGUMENTS:

. . . THE SOVIETS SEEK TO DOMINATE SPACE IN WARTIME.

. . . THEY HAVE BUILT A SPACE FORCE CAPABLE OF RAPID LAUNCH, DESIGNED TO PROVIDE THEIR WARFIGHTING FORCES CONTINUOUS SPACE-BASED SUPPORT.

. . . MOST OF THEIR SATELLITES SUPPORT SOVIET MILITARY FORCES.

. . . THE SOVIET HAVE A WIDE RANGE OF ANTISATELLITE SYSTEMS DESIGNED TO DESTROY OUR SATELLITES.

. . . OUR MILITARY FORCES DEPEND ON THE SUPPORT PROVIDED BY OUR SATELLITES.

. . . IN A CRISIS OR CONFLICT, THE SOVIETS WOULD ATTACK OUR SATELLITES.

. . . WE HAVE NOTHING TO DETER THE SOVIETS FROM ATTACKING OUR SATELLITES.

. . . WE CANNOT WIN A WAR BY WINNING IN SPACE, BUT WE CAN LOSE A WAR BY LOSING IN SPACE.

. . . WE HAVE NO WAY TO RESPOND TO A SOVIET ANTISATELLITE ATTACK, EXCEPT BY SURRENDERING SPACE TO THE SOVIETS, OR TAKING SOME KIND OF ACTION ON EARTH----AGAINST THE SOVIET HOMELAND OR FORCES.

. . . WE ARE IN THIS POSITION BECAUSE CONGRESS HAS PROHIBITED US FROM TESTING OUR CANDIDATE SYSTEM.

. . . CONGRESS IS US.

AND FINALLY, AND MOST IMPORTANTLY, IF IT IS OUR WILL THAT THIS UNSATISFACTORY SITUATION BE RECTIFIED, IT WILL BE.

IF WE DO NOT RECTIFY THIS SITUATION, AND SHOULD DETERRENCE FAIL FOR ANY REASON, THEN WE----OUR NATION----WILL PAY THE PRICE OF OUR NEGLECT IN AMERICAN LIVES. I CANNOT PUT A HAPPY FACE ON IT, AND I WILL NOT GLOSS OVER THE FACTS JUST TO MAKE YOUR DINNER MORE ENJOYABLE. THE CLOSEST I CAN COME TO ENDING ON AN "UP" NOTE IS TO REPEAT, THAT WE HAVE PLACED OURSELVES IN THIS POSITION, AND WE CAN GET OURSELVES OUT OF IT.

I LOOK FORWARD TO YOUR QUESTIONS . . . .

GENERAL JOHN L. PIOTROWSKI
CHAMBER OF COMMERCE
BOISE, IDAHO
2 MAY 1988

MY REMARKS TODAY WILL FOCUS ON OUR SPACE CAPABILITIES, AND ALSO THOSE OF OUR PRINCIPAL COMPETITOR, THE SOVIET UNION.

RECENTLY, SEVERAL GOVERNMENTAL AND INDUSTRIAL DIGNITARIES HAVE SPOKEN ON WHERE WE STAND VIS-A-VIS THE SOVIET UNION IN SPACE. THEIR THRUST HAS BEEN THAT THE U.S. HOLDS A LEAD IN SPACE----PRINCIPALLY BECAUSE OUR SATELLITES ARE BETTER----AND THAT'S THE GOOD NEWS. OUR SATELLITES PROVIDE MORE TIMELY AND PRECISE INFORMATION AND DISTRIBUTE IT TO PEOPLE WHO NEED IT----THE MILITARY COMMANDERS AND LEADERS THROUGHOUT THE WORLD. THOSE SYSTEMS DO A BETTER JOB THAN ANYTHING THAT THE SOVIETS EMPLOY. I AGREE WITH THAT ASSESSMENT----THEY ARE EXACTLY CORRECT.

THERE IS ANOTHER SIDE, THOUGH, WHICH I'D LIKE TO SPEAK TO AS WELL. IT'S INTERESTING TO ME THAT AS WE PASS THE 30TH ANNIVERSARY OF THE SPUTNIK, AND LOOK BACK ON THE HISTORY OF THOSE 30 YEARS. THE SOVIETS HAVE HAD SOME 2,000 LAUNCHES OF SPACECRAFT, THE UNITED STATES ROUGHLY 1,000. OUR RECORD OF ACHIEVEMENT IN TERMS OF RELIABILITY, HOWEVER, IS ROUGHLY THE SAME.

WHILE THE SOVIETS HAVE DEVELOPED THEIR CAPABILITY IN SPACE BECAUSE OF TECHNOLOGICAL INFERIORITY, WHAT HAS RESULTED IS A SPACE INFRASTRUCTURE THAT IS SUPERIOR TO OURS. LET ME GIVE YOU SOME EXAMPLES. THE SOVIETS, RIGHT FROM THE OUTSET, RECOGNIZED THAT THEY DID NOT HAVE THE COMPUTER TECHNOLOGY, THEY DID NOT HAVE THE MINIATURIZATION, AND THEY DID NOT HAVE THE MANUFACTURING TECHNIQUES THAT WE HAVE IN THIS COUNTRY. AS A RESULT, THEY BUILT HUGE BOOSTERS, ON WHICH THEY WERE ABLE TO LAUNCH LARGE SPACECRAFT. ON THE OTHER HAND, WE BUILT RATHER SMALLER BOOSTERS TO LAUNCH LIGHTER WEIGHT, TECHNOLOGICALLY SUPERIOR SPACECRAFT.

AS A RESULT, THE SOVIETS HAVE TWICE AS MANY LAUNCH PADS AS WE DO. THEY PUT UP TEN TIMES AS MUCH THROW WEIGHT, AND LAUNCH ROUGHLY A HUNDRED SATELLITES A YEAR. WE LAUNCH, IN A GOOD YEAR, ON THE AVERAGE OF 20 SATELLITES. IN 1987 WE CONDUCTED NINE LAUNCHES. LAST YEAR THEY HAD 98 LAUNCHES, AND THEIR EXCESS BOOSTER CAPACITY APPROACHES ONE MILLION POUNDS ANNUALLY.

THOSE ARE WORRISOME NUMBERS BECAUSE ONE HAS TO BELIEVE THAT A NATION LIKE THE SOVIET UNION WOULD NOT JUST ACCIDENTALLY DEVELOP THAT KIND OF CAPABILITY. THEY WOULD HAVE TO DELIBERATELY SPEND A GREAT

AMOUNT OF MONEY TO DEVELOP THAT IMPRESSIVE LAUNCH CAPACITY, BECAUSE IN FACT, THEY ARE ECONOMICALLY POOR, AGRICULTURALLY POOR, AND THERE ARE NUMEROUS OTHER THINGS THEY COULD SPEND THEIR MONEY ON.

EXPERTS SUGGEST THAT IN TEN YEARS THEY'LL HAVE TWO MILLION POUNDS OF EXCESS CAPACITY. THAT IS TRULY WORRISOME IF YOU LOOK AT THE MILITARY POTENTIAL IT PROVIDES.

LAST YEAR, THERE WERE JUST UNDER 700 MISSILE AND SPACE LAUNCHES IN THE ENTIRE WORLD. THAT TOTAL INCLUDES LAUNCHES BY CHINA, JAPAN, INDIA, AND THE EUROPEAN SPACE AGENCIES, IN ADDITION TO THE U.S. AND THE SOVIET UNION. OVERALL, THE SOVIETS LAUNCHED MORE THAN 550 OF THOSE----NEARLY 85 PERCENT OF THE WORLD'S TOTAL LAUNCH EXPERIENCE IN 1987. THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND LOOKS AT ALL THOSE LAUNCHES, AND OUR PEOPLE ARE VERY PRACTICED AND EXPERIENCED IN THAT MISSION. AS A RESULT OF ALL THAT ACTIVITY, THE SOVIETS HAVE ON THE AVERAGE OF 150 SATELLITES IN SPACE AT ALL TIMES. TRUE, THEIR SYSTEMS ARE TECHNOLOGICALLY INFERIOR TO OURS, THEY'RE SHORT LIVED, THEY MAY SPEND ANYWHERE FROM TWO MONTHS TO SIX MONTHS IN SPACE. BUT WHAT THAT ALSO TELLS US IS THAT THEY HAVE LOTS OF SATELLITES READY TO LAUNCH, AND LOTS OF BOOSTERS. THEY TEND TO LAUNCH "ON DEMAND," NOT "ON SCHEDULE"----WHICH IS A CASE OF TURNING A TECHNOLOGICAL INFERIORITY INTO AN OPERATIONAL STRENGTH. IF THEY LOSE A SATELLITE, THEY HAVE THE CAPABILITY TO REPLACE IT QUICKLY. IF WE LOSE A SATELLITE, WE DON'T HAVE THE SAME RECONSTITUTION CAPABILITY.

AS I MENTIONED EARLIER, THE GOOD NEWS IS THAT OUR SATELLITES ARE SIGNIFICANTLY SUPERIOR TO THE SOVIETS. THEY LAST LONGER, THEY PROVIDE BETTER INFORMATION, MORE RELIABILITY, AND MORE REDUNDANCY. WITHOUT THAT RELIABILITY, SURVEILLANCE AND WARNING FUNCTIONS PROVIDED FROM SPACE COULD HAVE BEEN SERIOUSLY DEGRADED FOLLOWING THE SHUTTLE ACCIDENT WHEN OUR LAUNCH OF REPLACEMENT CAPABILITY WAS REDUCED TO VIRTUALLY ZERO. IF WE WERE IMMUNE TO ACCIDENTS AND IF THERE WERE NO THREAT TO OUR SATELLITES, THEN WE WOULD BE IN GOOD SHAPE. BUT UNFORTUNATELY THAT IS NOT THE CASE.

IN 1971 THE SOVIETS FIELDED AN OPERATIONAL ANTISATELLITE CAPABILITY. IT'S NOT VERY SOPHISTICATED. SOME HAVE EVEN SUGGESTED THAT IT'S CRUDE. BASICALLY, IT'S AN ORBITAL SATELLITE THAT CLOSES TO KILL OTHER

SATELLITES. IT FLIES IN THE SAME ORBIT AS THE VICTIM SATELLITE, CLOSES IN ON THE TARGET, THEN FIRES A CHARGE SIMILAR TO A SHOTGUN SHELL AND DESTROYS THE TARGET BY FRAGMENTING IT.

SOME HAVE SUGGESTED THAT THIS SOVIET ASAT CAPABILITY IS CRUDE AND, THEREFORE, WE SHOULD IGNORE IT. SINCE IT HASN'T BEEN USED RECENTLY OR HASN'T BEEN TESTED RECENTLY----THIS ARGUMENT GOES----WE SHOULD NOT BE CONCERNED ABOUT IT.

BUT THE SOVIET CO-ORBITAL ASAT IS A VERY REAL THREAT TO OUR SPACECRAFT, NO MATTER HOW IT LOOKS ON THE DRAWING BOARDS OR IN OUR MIND'S EYE.

THEIR ASAT MAY BE LARGE, IT MAY BE A DIFFERENT TECHNOLOGY, BUT IT'S VERY DEADLY. AND IT'S BEEN SUGGESTED THAT SOVIETS HAVE SHOWN RESTRAINT BECAUSE THEY HAVE NOT TESTED THIS ANTISATELLITE SYSTEM IN ITS ENTIRETY SINCE 1982. THAT IS TRUE. THEY HAVE NOT LAUNCHED AN ASAT "AS SUCH." BUT THE BOOSTER HAS BEEN USED TO PUT OTHER SATELLITES IN SPACE REPEATEDLY----AND THE BOOSTER IS THE BRAINS OF THE SYSTEM.

THEY HAVE AN ADDITIONAL ASAT CAPABILITY, FROM TWO VERY POWERFUL LASERS AT A PLACE CALLED SARY SHAGAN, ONE OF THEIR RESEARCH AND DEVELOPMENT CENTERS.

THEY ALSO HAVE AN ANTIBALLISTIC MISSILE SYSTEM CALLED THE "GALOSH." WHILE PRIMARILY USED IN AN ANTIBALLISTIC MISSILE ROLE, THE GALOSH COULD BE USED AGAINST OUR LOW EARTH ORBITING SATELLITES. SO THE SOVIETS HAVE AT LEAST THREE FORMIDABLE TECHNOLOGIES TO DEGRADE OR TO ATTACK OUR SATELLITES.

WHEN YOU PUT THE PICTURE TOGETHER, WHAT YOU FIND IS THAT THEY CAN DENY US ESSENTIAL SPACE SUPPORT BY ATTACKING OUR SATELLITES. WE HAVE NO COMPARABLE CAPABILITY. IN THE CASE OF AN ASAT ATTACK, WE WOULD HAVE TO TAKE THE HIT AND SUFFER THE LOSS. IN A CRISIS, THAT COULD BE TERRIBLY DESTABILIZING AND DIRECTLY SIGNIFICANT IN TERMS OF OUR ABILITY TO NEGOTIATE AND TERMINATE A CRISIS.

THE COST OF DETERRING THE SOVIETS WITH THE ASAT SYSTEM THAT OUR AIR FORCE HAS DEVELOPED----BUT HAS YET TO BE DEPLOYED, DUE TO RESTRICTIONS IMPOSED BY CONGRESS----IS VERY MODEST, ESPECIALLY COMPARED TO THE TREMENDOUS INVESTMENT WE HAVE IN SPACE. AN INVESTMENT OF ABOUT 370 BILLION DOLLARS PLUS.

I BELIEVE VERY STRONGLY THAT WE NEED AN ANTISATELLITE CAPABILITY OF OUR OWN. NOT TO USE AGAINST THE SOVIETS, BUT TO DETER THEM FROM USING THEIRS. AND----SHOULD DETERRENCE FAIL----TO BE ABLE TO NEGATE THEIR WAR-SUPPORTING MILITARY CAPABILITY IN

SPACE. I BELIEVE VERY STRONGLY THAT IT IS DESTABILIZING FOR THE SOVIETS TO HAVE A SIGNIFICANT MILITARY CAPABILITY, AND US NOT HAVE A SIMILAR CAPABILITY WITH WHICH TO DETER THEM. ONE TALKS ABOUT NEGOTIATING AWAY ANTISATELLITE SYSTEMS SO THAT SATELLITES WOULD BE IMMUNE TO ATTACK. THAT'S FINE, BUT WE SHOULD NEGOTIATE FROM A POSITION OF STRENGTH. HISTORY HAS TAUGHT US THAT THROUGH SOME VERY IMPORTANT LESSONS.

AND THAT LEADS ME TO THE NEED FOR SDI. IF YOU LOOK AT THE PLAIN AND SIMPLE TRUTH, TODAY, THE SOVIET UNION HAS A CAPABILITY TO DESTROY AMERICA----TO DESTROY OUR FREEDOMS AND OUR CHERISHED VALUES----WITH BALLISTIC MISSILES. IT IS ALSO TRUE, AT LEAST FOR NOW, THAT THE FUTURE OF THE SOVIET UNION IS IN THE HANDS OF AMERICA BECAUSE WE HAVE THE CAPABILITY TO DESTROY THEM. BUT I WOULD LIKE TO SEE US MOVE TO A POSITION WHERE WE CAN DEFEND AMERICA AND OUR ALLIES AND FROM THAT POSITION, BUILD DOWN THOSE INTERCONTINENTAL BALLISTIC MISSILES. WE BELIEVE WE HAVE THE CAPABILITY AND THE TECHNOLOGY TO DO THAT WITHIN THE SDI RESEARCH.

NOW FOR THOSE FOUR SPECIOUS ARGUMENTS AGAINST SDI. THE ARGUMENTS ARE ABOUT WHY WE SHOULDN'T PURSUE IT, BECAUSE: IT WON'T WORK, IT COSTS TOO MUCH, IT'S NOT LEAKPROOF, AND IT WOULD INVITE THE SOVIETS TO ATTACK US. LET'S LOOK AT EACH OF THESE MYTHS BRIEFLY.

REGARDING THE FIRST MYTH----THAT IT WON'T WORK----THERE ARE A GROUP OF EMINENT SCIENTISTS IN THIS COUNTRY WHO SAY IT CAN WORK, AND THAT WE'LL BE READY TO DEPLOY SDI CAPABILITIES IN THE IMMEDIATE FUTURE. THERE ARE OTHERS WHO ARE EQUALLY AS EMINENT THAT SAY MORE WORK NEEDS TO BE DONE, BUT THERE IS NO EVIDENCE TO INDICATE IT WON'T WORK, AND WE CAN SET THAT ARGUMENT ASIDE.

SECOND, THERE ARE THOSE WHO SAY SDI COSTS TOO MUCH. THIS NATION PUT A MAN ON THE MOON, IN THE 1960s AT A COST OF ABOUT FOUR TIMES THE PROJECTED COSTS OF THE SDI RESEARCH AND TECHNOLOGY DEVELOPMENT PROGRAM. THE BENEFITS OF SDI COULD FAR OUTWEIGH THOSE DERIVED FROM THE APOLLO PROGRAM.

AS FOR THE THIRD MYTH THAT SDI IS NOT LEAKPROOF, THE ARGUMENT BECOMES "WHY SHOULD WE BUILD A SYSTEM THAT WON'T STOP EVERYTHING?" WHEN YOU LOOK AT IT FROM A MILITARY PLANNING STANDPOINT, IT'S NOT VITAL THAT "EVERYTHING" BE STOPPED. WHAT IS IMPORTANT IS THAT THE SOVIETS COULDN'T COUNT ON WHAT THEY LAUNCHED GETTING THROUGH. AND IF THEY COULDN'T ENSURE THAT THEIR PRIMARY TARGETS----THE NATIONAL COMMAND AUTHORITIES, OUR ABILITY TO COMMUNICATE, AND OUR RETALIATORY FORCES----WOULD BE DESTROYED IN THE INITIAL ATTACK, THEN THEY WOULD BE VERY, VERY HESITANT TO ATTACK IN THE FIRST PLACE. A PRUDENT SOVIET

PLANNER WOULD HAVE TO SAY, "MR GENERAL SECRETARY, I MUST TELL YOU THAT WE MAY NOT BE SUCCESSFUL IN AN ATTACK ON THE UNITED STATES." SO A SYSTEM DOES NOT HAVE TO BE LEAK PROOF TO BE MILITARILY EFFECTIVE.

FINALLY, THERE IS THE WORST ARGUMENT WHICH SUGGESTS SDI IS DESTABILIZING AND WOULD INVITE THE SOVIETS TO ATTACK US, BECAUSE WE ARE DEFENDING OURSELVES. THE TRUTH IS THAT WHATEVER ONE THINKS ABOUT THE SOVIET UNION----THEY ARE RATIONAL WHEN IT COMES TO THEIR OWN SURVIVAL. THE SOVIETS ARE NOT ABOUT TO ATTACK US BECAUSE WE ARE DOING WHAT THEY HAVE ALREADY DONE, AND THEREBY INVITE US TO DESTROY THEM. THEY ARE GOING TO BE RATIONAL. SOME MAY ARGUE THAT WE MIGHT HAVE TO DEAL WITH AN IRRATIONAL GOVERNMENT, AND IT DOESN'T MAKE ANY DIFFERENCE WHAT YOU DO DEFENSIVELY BECAUSE YOU CANNOT DETER AN IRRATIONAL ACT, OR YOU CANNOT DETER IRRATIONAL LEADERSHIP. BUT THIS IS ALL THE MORE REASON WHY WE NEED A DEFENSIVE CAPABILITY, IN ORDER TO RESPOND TO SUCH IRRATIONALITY. TODAY WE DON'T HAVE THE CAPABILITY TO PROTECT OURSELVES AGAINST SUCH AN EVENT.

THOSE ARE MY RESPONSES TO THE FOUR DEMAGOGIC MYTHS ABOUT SDI AND ITS IMPORTANCE TO NATIONAL SECURITY.

KENNEDY . . . .

I APPRECIATE YOUR INTEREST IN BEING HERE TODAY AND WOULD LIKE TO NOW TURN MY ATTENTION TO YOUR QUESTIONS.

GENERAL JOHN L. PIOTROWSKI
JUNIOR OFFICER COUNCIL
KEESLER AIR FORCE BASE, MISSISSIPPI
11 MAY 1988

ACKNOWLEDGMENTS . . . .

I'M VERY PLEASED TO HAVE THE OPPORTUNITY TO SPEAK TO THIS COUNCIL OF JUNIOR OFFICERS. I KNOW MANY OTHERS HAVE TOLD YOU THAT YOU ARE THE FUTURE LEADERS OF THE AIR FORCE. THEY ARE RIGHT AND THAT MAKES THIS EVENING'S OPPORTUNITY EVEN MORE IMPORTANT TO ME.

A GOOD DEAL OF MY TIME----IN FACT I'D SAY MOST OF MY TIME----IS CONSUMED EDUCATING TODAY'S GOVERNMENT AND MILITARY LEADERS ABOUT SPACE. MOST OF THOSE I SPEAK TO, ARE AT OR NEAR THE PEAK OF THEIR CHOOSEN PROFESSIONS AND ALONG THE WAY THEY'VE FORMED OPINIONS ABOUT SPACE AND HOW WE SHOULD UTILIZE THIS MEDIUM. MANY HOLD A PERSPECTIVE BASED ON EXPERIENCES THEY HAD IN THE SIXTIES----A TIME WHEN OUR COUNTRY WAS FAR MORE FOCUSED ON OUR GOALS IN SPACE.

IF YOUR INTEREST IN SPACE IS INDICATED BY THE THEME OF THIS DINING OUT, THEN I CAN ALSO SAY THAT MOST OF MY AUDIENCES ARE NOT AS "SPACE SMART" AS YOU ARE. THEY AREN'T AS AWARE OF THE CRITICAL ROLE SPACE PLAYS IN SUPPORTING OUR NATIONAL LEADERSHIP AND MILITARY FORCES WORLDWIDE.

"SPACE----A LOOK INTO THE FUTURE" INDICATES TO ME THAT YOU ALREADY ACKNOWLEDGE THE ROLE OF SPACE IN THE AIR FORCE AND THE DEPARTMENT OF DEFENSE. FURTHERMORE, THAT THEME TELLS ME YOU EXPECT THE ROLE OF SPACE TO INCREASE SIGNIFICANTLY----AND NOT JUST FOR THE MILITARY, BUT ALSO FOR OUR ECONOMY. I FIRMLY BELIEVE YOU ARE RIGHT ON BOTH COUNTS.

I AM NOT GOING TO TALK TO YOU THIS EVENING ABOUT NEW ORGANIZATIONS TO IMPROVE OUR UTILIZATION OF SPACE, OR ABOUT THE NATIONAL AEROSPACE PLANE, OR PERMANENTLY MANNED MILITARY SPACE STATIONS, OR MOON BASES, OR EXPLORING THE PLANETS, AND SO ON. THESE THINGS MAY BE NECESSARY AND POSSIBLE, BUT FOR MOST OF THESE TOPICS YOU'D PROBABLY RATHER HEAR FROM THE SCIENTISTS AND ENGINEERS.

I'M HERE TONIGHT AS AN OPERATOR----A WARFIGHTER----AND I WANT TO SHARE WITH YOU MY "LOOK INTO THE FUTURE" FOR SPACE AS IT RELATES TO WARFIGHTERS. I'LL FOCUS ON THREE AREAS----ALL

PRESENTATIONS TO JUNIOR OFFICERS MUST, AS YOU KNOW, HAVE THREE MAIN POINTS----THAT I WANT YOU TO KEEP IN MIND WHEN YOU CONSIDER SPACE, AND AS YOU ADVANCE IN LEADERSHIP WITHIN THE AIR FORCE. THESE THREE POINTS ARE FIRST, SPACE SUPPORT OF OUR MILITARY FORCES IS, AND WILL BE, THE MOST IMPORTANT ROLE OF SPACE; SECOND, CONTROL OF SPACE IS AN ESSENTIAL INGREDIENT TO OUR USE OF SPACE; AND THIRD, NONE OF THE ABOVE MEANS ANYTHING UNLESS WE CAN GET TO SPACE. I'LL START WITH SPACE'S ROLE IN SUPPORT OF OUR WARFIGHTERS.

TODAY, OUR LAND, SEA, AND AIR FORCES ARE HEAVILY DEPENDENT UPON SPACE-BASED SYSTEMS FOR SURVEILLANCE, COMMUNICATIONS, NAVIGATION, AND ENVIRONMENTAL SUPPORT. THIS SPACE-DERIVED SUPPORT TO OUR FORCES----COMBAT SUPPORT, IF YOU WILL----IS THE PRIMARY ROLE OF SPACE TODAY AND WILL REMAIN THE PRIMARY ROLE IN THE NEAR- AND MID-TERM----CLEARLY WELL INTO THE NEXT CENTURY. WHILE THERE ARE MANY INITIATIVES TO PROVIDE EXPANDED SUPPORT FROM SPACE, ONE INITIATIVE IS PARTICULARLY IMPORTANT TO THE WARFIGHTER.

SPACE OFFERS UNIQUE OPPORTUNITIES FOR WIDE AREA SURVEILLANCE AND TRACKING. WE CAN BEST CAPITALIZE ON THESE OPPORTUNITIES BY DEVELOPING AND DEPLOYING A

SPACE-BASED RADAR SYSTEM. A SPACE-BASED RADAR WOULD QUICKLY BECOME AN ESSENTIAL TOOL FOR PROVIDING EARLY WARNING ABOUT THE BUILD UP OR MOVEMENT OF POTENTIAL HOSTILE FORCES.

SPACE IS THE MOST EFFECTIVE PLACE FROM WHICH TO DETECT AND MONITOR THE THREATS OUR LAND, SEA, AND AIR FORCES FACE IN THE TERRESTRIAL ENVIRONMENT. THOSE THREATS INCLUDE A REJUVENATED SOVIET BOMBER FORCE ARMED WITH CRUISE MISSILES, SEVERAL VERSIONS OF MOBILE BALLISTIC MISSILES, A BLUE-WATER NAVY WHICH WILL SOON INCLUDE CONVENTIONAL AIRCRAFT CARRIERS, AND GROUND- AND SEA-LAUNCHED CRUISE MISSILES. A SPACE-BASED RADAR SYSTEM CAN IDENTIFY THESE THREATS----EVEN FROM THEIR POINTS OF ORIGIN----AND WARN OUR FORCES WHILE THERE IS AMPLE TIME TO RESPOND.

WHEN ONE CONSIDERS THESE THREATS, IT'S EASY TO SEE HOW OUR WARFIGHTERS----THE UNIFIED COMMANDERS----OF THE FUTURE, WILL BE BETTER ABLE TO DEFEND AND EMPLOY THEIR FORCES . . . GIVEN THE STRATEGIC AND TACTICAL INFORMATION AVAILABLE FROM A SPACE-BASED RADAR SYSTEM. SUCH A SYSTEM IS TECHNICALLY FEASIBLE AND COULD BE DEPLOYED AT A RELATIVELY MODEST COST. IN MY JUDGMENT, A SPACE-BASED RADAR IS CLEARLY "IN THE CARDS." ANOTHER ESSENTIAL CAPABILITY IS ALSO "IN THE CARDS" FOR SPACE----THAT CAPABILITY IS A SPACE NEGATION, OR ANTISATELLITE SYSTEM.

A SECOND ISSUE THAT IS RELEVANT TO THE WARFIGHTERS OF TODAY, AND TOMORROW, DEALS WITH THE NEED TO CONTROL SPACE. TODAY, ONLY ONE NATION IN THE WORLD HAS THE ABILITY TO CONTROL SPACE IN A CRISIS OR IN WARTIME----ONLY THE SOVIET UNION HAS AN OPERATIONAL ANTISATELLITE CAPABILITY. THE IMPACT OF THIS ASYMMETRY IS WORRISOME. SHOULD DETERRENCE FAIL, THE SOVIETS HAVE THE WHEREWITHAL TO DESTROY OUR SATELLITES IN LOW-EARTH ORBIT BY EMPLOYING EITHER OF THEIR TWO KINETIC KILL SYSTEMS----THEIR CO-ORBITAL ASAT OR THEIR ANTIBALLISTIC MISSILE SYSTEM. KINETIC KILL SYSTEMS, HOWEVER, ARE NOT THE ONLY ANTISATELLITE TECHNOLOGIES THE SOVIETS HAVE AVAILABLE.

BY EMPLOYING LASERS OR ELECTRONIC WARFARE TECHNOLOGIES, THEY CAN PROBABLY INCAPACITATE, AT LEAST TO SOME DEGREE, AN EVEN GREATER NUMBER OF OUR SATELLITES. THIS COULD LEAVE OUR WARFIGHTERS WITHOUT THEIR EYES AND EARS----A POSITION OF CONSIDERABLE DISADVANTAGE.

THE LOSS OF SURVEILLANCE, COMMUNICATIONS, NAVIGATION, AND ENVIRONMENTAL SUPPORT WOULD CERTAINLY HAVE SIGNIFICANT, ADVERSE MILITARY IMPLICATIONS. BUT OUR LACK OF AN ANTISATELLITE CAPABILITY ALSO IMPACTS OUR ABILITY TO DETER AND, SHOULD DETERRENCE FAIL, OUR ABILITY TO CONTROL ESCALATION IN SPACE AND PROSECUTE THE WAR TO A

FAVORABLE TERMINATION. OUR COUNTRY IS BEGINNING TO RECOGNIZE THE CRITICAL NATURE OF THE SHORTFALL IN THIS AREA. A SATELLITE NEGATION CAPABILITY IS IN OUR "LOOK INTO THE FUTURE."

CONGRESS APPEARS, AT LAST, TO BE MOVING AWAY FROM THE MORATORIUM PLACED ON THE DEVELOPMENTAL TESTING OF A U.S. ASAT CAPABILITY. I BELIEVE WE WILL EVENTUALLY DEVELOP AND HAVE AT OUR DISPOSAL A VARIETY OF ASAT CAPABILITIES. THESE CAPABILITIES ARE ESSENTIAL TO ENSURE OUR FREE USE OF SPACE AND THE AVAILABILITY OF THE CRITICAL SUPPORT PROVIDED FROM SPACE.

OUR FUTURE IN SPACE----NO MATTER HOW IT ACTUALLY TURNS OUT----WILL CERTAINLY DEPEND ON OUR ABILITY TO GET THERE. THE CHALLENGER ACCIDENT SHOOK MOST AMERICANS IN A PERSONAL WAY AND IT SHOOK OUR SPACE INFRASTRUCTURE TO THE VERY FOUNDATION. WE WENT THROUGH THE INTENSE EVALUATION OF OUR TECHNOLOGY; OUR MANAGEMENT AND DECISION-MAKING PROCESSES; AND OUR BASIC STRATEGY FOR GOING TO SPACE----A PROCESS AFFORDED AND NECESSITATED BY OUR DEMOCRACY.

WE ARE WELL DOWN THE ROAD TO LAUNCH RECOVERY. OUR LAUNCH PADS ARE READY, THE SHUTTLE IS SCHEDULED TO RESUME OPERATIONS THIS YEAR, AND WE HAVE CLEARLY AND EMPHATICALLY MOVED AWAY FROM DEPENDING ON A SINGLE LAUNCH SYSTEM FOR ACCESS TO SPACE----A SERIOUS

MISTAKE OF OUR PAST. WE ARE BUILDING TITAN IVs AND DELTA IIs AND WE ARE LOOKING AT ADVANCED LAUNCH SYSTEMS----NEW LAUNCH CONCEPTS THAT WE HOPE WILL SUBSTANTIALLY REDUCE THE COST OF LAUNCH AND BE MORE RESPONSIVE TO THE NEEDS OF OUR WARFIGHTERS.

IN SUMMARY, THE NEEDS OF OUR WARFIGHTERS----THE SOLDIERS, SAILORS, AIRMEN, AND MARINES----WILL CONTINUE TO BE OUR FOCUS FOR THE FUTURE. SPACE IS THE PLACE FROM WHICH WE CAN BEST SUPPORT THOSE WHO IMPLEMENT OUR MILITARY PLANS. A SPACE-BASED RADAR IS ONE SUCH CRITICAL SUPPORT SYSTEM.

SPACE-BASED SYSTEMS WILL CONTINUE TO BE OUR BEST SOURCE OF SUPPORT INFORMATION. WE MUST BE ABLE TO DETER AGGRESSION AGAINST THESE SYSTEMS AND, SHOULD DETERRENCE FAIL, TO SHOW OUR RESOLVE----TO RESPOND IN WAYS THAT CONVINCE THE AGGRESSOR THAT THE COSTS OF HIS ACTIONS OUTWEIGH THE BENEFITS. A SATELLITE NEGATION CAPABILITY IS THAT NECESSARY DETERRENT.

FINALLY, IF WE ARE TO USE SPACE, EXPLORE SPACE, AND PERHAPS LIVE IN SPACE, THEN WE MUST HAVE THE MEANS TO GET THERE IN AN ECONOMICAL, FLEXIBLE MANNER.

THESE MILITARY EFFORTS IN SPACE ARE TYPICALLY NOT AS INTERESTING AS THE NASA PROGRAMS. THEY DON'T NORMALLY GENERATE BROAD-BASED PUBLIC SUPPORT BY APPEALING TO THE EXPLORER, FRONTIERSMAN, ADVENTURER SPIRIT OF MOST AMERICANS. BUT THESE MILITARY PROGRAMS PRESERVE THE NATIONAL SECURITY----TO PROTECT OUR SPACE ASSETS----TO SUPPORT THOSE ON THE EARTH WHO DEFEND OUR COUNTRY AND WAY OF LIFE----AND TO ENSURE OUR RIGHT TO BE IN AND EXPLORE SPACE----IS A SOLEMN OBLIGATION, AN UNAVOIDABLE PREREQUISITE TO MEETING OUR NATIONAL SECURITY GOALS AND PURSUING THOSE MORE EXCITING PROGRAMS THAT WILL TAKE US TO SPACE.

I CHALLENGE EACH OF YOU TO EXPAND YOUR KNOWLEDGE OF SPACE AND TO KEEP YOUR FOCUS ON THE WARFIGHTER.

BEST WISHES AND THANK YOU.

GENERAL JOHN L. PIOTROWSKI, USAF
SUMTER ROTARY CLUB
SUMTER, SOUTH CAROLINA
13 MAY 1988

THANK YOU, JACK, MR PRESIDENT, REVEREND, FRIENDS, COLLEAGUES, PATRIOTS ALL.

IT'S REALLY GREAT TO BE BACK WITH YOU AGAIN AND BE BACK IN SUMTER, AND IT'S BEAUTIFUL SPRING/SUMMER WEATHER THAT I LEARNED TO ENJOY FOR THREE PLUS YEARS. IT GIVES ME AN OPPORTUNITY TO EXPRESS MY APPRECIATION FOR TWO THINGS.

ONE, AS PARENTS REPRESENTATIVE OF ALL OF THE GREAT PARENTS ACROSS THIS COUNTRY OF OURS, FOR THE OUTSTANDING JOB THAT PARENTS ARE DOING IN PREPARING YOUNG MEN AND WOMEN THESE DAYS FOR ENTRY INTO SERVICES TO THEIR COUNTRY. AND WE ARE JUST RECEIVING FANTASTIC YOUNG MEN AND WOMEN WHO ARE BETTER AWARE, BETTER EDUCATED, MORE COMMITTED, WHO REALLY WANT TO SERVE THEIR COUNTRY IN A MEANINGFUL WAY. AND IT'S JUST AN OPPORTUNITY FROM ME TO SAY THANKS. MOST OF THEM ARE JUST LIKE NANCY, WHO WE HONORED JUST A LITTLE BIT AGO, AND WHO SO RICHLY DESERVE THOSE HONORS.

I ALSO WANT TO THANK YOU FOR THE SUPPORT THAT I RECEIVED FROM THE SOUTH CAROLINA DELEGATION. NOT ME PERSONALLY, BUT IN IMPORTANT NATIONAL DEFENSE PROGRAMS. I'LL TALK A LITTLE MORE ABOUT WHAT SENATOR HOLLINGS HAS PERSONALLY DONE TO MOVE SOME PROGRAMS THAT ARE IMPORTANT TO ALL OF US. AND I'LL TALK ABOUT THOSE PROGRAMS AS WELL AS CONGRESSMAN SPRATT AND SENATOR THURMOND.

NOW, I REALIZE HOW TOUGH IT IS TO SPEAK THIS EARLY IN THE MORNING AND TO CAPTIVATE A GROUP. IN FACT, WINSTON CHURCHILL WAS SO ELOQUENT WHEN HE SAID "AN AFTER-BREAKFAST SPEECH WAS ONE OF THE THREE MOST DIFFICULT THINGS IN THE WORLD. THE OTHER TWO BEING TO CLIMB A SMOOTH WALL THAT'S LEANING TOWARD YOU, OR TO TRY AND KISS A BEAUTIFUL LADY THAT'S LEANING AWAY." I HAD NOT HAD ANY EXPERIENCES WITH THE SMOOTH WALL TRICK, BUT WITH BEAUTIFUL LADIES I CAN ASSURE YOU HE'S RIGHT.

NOW, I'VE GOTTEN A LOT OF ADVICE IN MY CAREER ON HOW LONG ONE SHOULD SPEAK. AND REVEREND, I'M SURE YOU CAN APPRECIATE THIS. WHILE I WAS HERE, I WAS INVITED TO SPEAK AT THE RAFTING CREEK BAPTIST CHURCH ON FELLOWSHIP AND LEADERSHIP----RATHER BROAD SUBJECTS AND ONES THAT I THOUGHT I KNEW A LITTLE BIT ABOUT. I FIGURED 30 MINUTES WITH ME IS ABOUT ALL ANYBODY COULD EVER STAND, SO I PREPARED A LOT OF NOTES AND SPOKE FOR

ABOUT 32 MINUTES. AFTER IT WAS OVER, WE WENT THROUGH THE REST OF THE SERVICE, AS THE KIND MINISTER WAS ESCORTING ME TO THE DOOR, I SAID, "REVEREND, HOW DID I DO?" HE SAID, "WELL, I DON'T KNOW WHAT THE PARISHIONERS ARE GONNA DO THE REST OF THE AFTERNOON." I SAID, "WHAT DO YOU MEAN BY THAT?" HE SAID, "NORMALLY, WE EXPECT THE MESSAGE TO LAST AN HOUR AND A HALF, TWO HOURS, AND YOU LEFT THEM KIND OF SHORT." WELL, WITH THAT I PUT IT IN THE COMPUTER.

WHEN I WAS IN WASHINGTON WORKING WITH ED, I WAS INVITED TO SPEAK AT A PRESBYTERIAN CHURCH. SO REMEMBERING MY BAPTIST EXPERIENCE, I REALLY PUT TOGETHER A LOT OF WORDS. AS I WAS BACK BEHIND THE PULPIT WITH THE MINISTER, HE SAW THE SHEETS OF PAPERS I PULLED OUT OF THE BRIEFCASE AND HE PUT HIS ARM AROUND ME AND SAID, "SON, IN THIS CHURCH WE DON'T BELIEVE THAT ANY SOULS ARE SAVED AFTER FIVE MINUTES . . . AND YOU START LOSING CONVERTS AFTER TEN." WELL, I'D LIKE TO SAVE A FEW SOULS AND I DON'T WANT TO LOSE ANY CONVERTS, SO I'LL KEEP MY REMARKS SHORT.

YOU KNOW, I WENT TO THE SCHOOLS THAT JACK MENTIONED. I WENT TO A COUPLE OF OTHERS, AND YOU LEARN A LOT ABOUT PUBLIC SPEAKING IN GOING TO SCHOOL. I WENT TO NEBRASKA, I WENT TO HARVARD, AND I WENT TO THE UNIVERSITY OF TEXAS. EACH ONE OF THEM HAS A UNIQUE AND DIFFERENT PHILOSOPHY ABOUT PUBLIC SPEAKING.

IN NEBRASKA THEY SAY YOU NEED TO HAVE ONE SUBJECT, DRIVE THAT HOME, DRIVE THAT HOME, DRIVE THAT HOME, JUST LIKE CARRYING THE FOOTBALL THREE YARDS IN A CLOUD OF DUST. DON'T LET ANYBODY MISUNDERSTAND WHERE YOU'RE COMING FROM AND WHAT YOU STAND FOR.

LATER AT HARVARD, I LEARNED THAT ONE SHOULD NEVER BE UNDERSTOOD. THAT YOU SHOULD HAVE AS MANY SUBJECTS AS ONE CAN POSSIBLY COVER IN A LENGTH OF TIME. DON'T LET ANYBODY KNOW WHERE YOU STAND ON ANY ONE OF THEM, OR ELSE YOU'LL BE HELD RESPONSIBLE.

THEN I WENT TO THE UNIVERSITY OF TEXAS, WHERE THEY SAID YOU HAD TO HAVE EXACTLY TWO POINTS. AND YOU SHOULD COVER THOSE RATHER THOROUGHLY AND ELOQUENTLY BUT SEPARATE THEM BY A LOT OF BULL. THAT'S ALWAYS BEEN A VERY USEFUL APPROACH. NOW, I WILL TAKE OFF IN MY REMARKS REMEMBERING THE IMMORTAL WORDS OF ELIZABETH TAYLOR TO HER SEVERAL HUSBANDS . . . "I WON'T KEEP YOU LONG."

I'D LIKE TO TALK ABOUT THOSE TWO SUBJECTS THAT I LEARNED FROM THE UNIVERSITY OF TEXAS. AND FIRST I'D LIKE TO TALK A LITTLE BIT ABOUT SPACE. THEN I'D LIKE TO TALK A LITTLE BIT ABOUT THE PRESIDENT'S STRATEGIC DEFENSE

INITIATIVE. BOTH OF THOSE PROGRAMS ARE ENORMOUSLY IMPORTANT TO ALL OF US AND YET WE CAN'T TOUCH OR SEE THEM. IT'S VERY UNLIKELY THAT WE'LL EVER BE ABLE TO TOUCH AND SEE THEM----EXCEPT MAYBE A FLASH IN THE MIDNIGHT SKY.

THERE HAVE BEEN A LOT OF ARTICLES IN NATIONAL MAGAZINES. ONE RECENTLY BY NEWSWEEK; ONE EARLIER BY TIME, "THE U.S. IS LOST IN SPACE----SOVIETS TAKE OVER SPACE LEADERSHIP." I'D REALLY LIKE TO TELL YOU THE TRUTH ABOUT THOSE ARTICLES. AND THE TRUTH HAS TWO SIDES. I NEED TO GO BACK WITH JUST A LITTLE HISTORY.

SPACE ALL STARTED ON 4 OCTOBER 1957, WHEN THE SOVIETS LAUNCHED THEIR SPUTNIK AND GALVANIZED THE UNITED STATES, WHICH HAD BEEN TRYING----THE ARMY, THE NAVY, THE AIR FORCE HAD ALL BEEN TRYING----TO LAUNCH A SATELLITE AND GET INVOLVED IN SPACE OPERATIONS. BUT IT HAD EXPERIENCED FAILURE UP UNTIL THAT POINT.

SHORTLY AFTER SPUTNIK, THE ARMY LAUNCHED A SATELLITE WHICH STARTED US ON A RATHER STEEP, ACCELERATED CLIMB AT GETTING THINGS INTO SPACE THAT SERVED THIS NATION. WE TOOK OFF AT A RAPID RATE, LAUNCHING 50, 60, 70 SATELLITES A YEAR. UNTIL ABOUT THE MID-60s----1966 COMES TO MIND----WHERE TECHNOLOGY MARRIED WITH OUR DESIRE TO PUT THINGS INTO SPACE THAT WOULD BE USEFUL TO OUR NATIONAL COMMAND AUTHORITY, THE PRESIDENT, AND USEFUL TO MILITARY FORCES IN THE FIELD----PROVIDING THEM COMMUNICATIONS, INFORMATION, WEATHER, AND THE THINGS THAT THEY NEEDED TO FIGHT BETTER AND BE MORE EFFECTIVE.

WHEN THAT TECHNOLOGY CAME ALONG, IT ALLOWED US TO BUILD LONGER LIVED SATELLITES. SATELLITES THAT INSTEAD OF LASTING MONTHS, WOULD LAST YEARS. SOME OF OUR SATELLITES HAVE BEEN IN SPACE TODAY, 6, 7, 10, 11 YEARS AND ARE STILL WORKING. THAT'S A GREAT CREDIT TO THE INDUSTRIAL TECHNOLOGY OF THIS NATION IN TERMS OF REDUNDANCY, RELIABILITY, AND QUALITY OF WORKMANSHIP.

ON THE OTHER HAND, THE SOVIETS STARTED A LITTLE SLOWER AFTER SPUTNIK. BUT THEN THEY TOO, IN ABOUT 1961 OR 1962 LEAPED SHARPLY INTO SPACE WITH 50, 60, 70, 80, 90, 100 LAUNCHES. AND THEY'VE NEVER SLOWED DOWN. TODAY, THEY ARE LAUNCHING ABOUT 100 SATELLITES A YEAR COMPARED TO OUR NINE OR TEN. NOW, ON A GOOD YEAR----BEFORE THE CHALLENGER TRAGEDY----WE WOULD LAUNCH PERHAPS 15 SATELLITES TO REPLACE THOSE THAT WERE DYING OR DECAYING IN SPACE TO KEEP DOING THE JOB. AFTER THE CHALLENGER TRAGEDY, WE'VE BEEN ABLE TO LAUNCH BETWEEN SIX AND NINE. THE SOVIETS ARE LAUNCHING 100. SO THEY OUT LAUNCH US FIFTEEN TO ONE.

THAT IS IMPORTANT AND IT ISN'T IMPORTANT. IT ISN'T IMPORTANT BECAUSE OUR SATELLITES ARE BETTER AND LONGER LIVED, SO WE DON'T NEED TO LAUNCH THAT MUCH. IT IS IMPORTANT, BECAUSE BY LAUNCHING 100 TIMES A YEAR, THEY HAVE DEVELOPED A TREMENDOUS INFRASTRUCTURE---- A TREMENDOUS SUPPORT INFRASTRUCTURE----WHICH MEANS THEY HAVE A HOT PRODUCTION BASE OF PROPELLANT, A HOT PRODUCTION BASE OF BOOSTERS, AND A HOT PRODUCTION BASE OF SATELLITES.

IN FACT, IT IS CLEAR TO ME AND THOSE WHO MONITOR THEIR ACTIVITIES, THAT THEY HAVE A LARGE WAR RESERVE STOCKPILE OF THINGS TO PUT INTO SPACE, AND BOOSTERS TO PUT THEM INTO SPACE WITH. I CAN'T FIND THAT THEY'VE EVER THROWN AWAY ONE OF THEIR LAUNCH VEHICLES. IT IS MY ESTIMATION THAT ONE OF THEIR BOOSTERS ALONE HAS LAUNCHED NEARLY AS MANY SATELLITES BY ITSELF, AS THIS ENTIRE NATION ON ANYTHING WE'VE EVER LAUNCHED. IN THE COURSE OF SPACE HISTORY, THEY'VE LAUNCHED OVER 2,000, IN FACT, APPROACHING 2,100 SATELLITES. THIS NATION HAS LAUNCHED JUST A LITTLE OVER 800. NOW THOSE NUMBERS IN THEMSELVES ARE INSIGNIFICANT, EXCEPT WHEN YOU LOOK AT THE ENORMOUS INFRASTRUCTURE THAT REPRESENTS. THEY HAVE TWICE AS MANY LAUNCH PADS, FOUR TIMES AS MANY PEOPLE, AND LOTS OF PROVEN EQUIPMENT.

LET ME JUST GIVE YOU ONE DATA POINT WHERE IT SHOWS HOW EFFECTIVE THE SOVIETS CAN BE IF THEY WANT TO DO SOMETHING IN SPACE. DURING THE FALKLANDS WAR OF SPRING TO SUMMER OF 1982, THE SOVIETS TOOK AN INTEREST IN WHAT THE BRITISH WERE DOING OFF THE COAST OF ARGENTINA. AND SO THEY, IN A VERY SHORT PERIOD OF TIME----IN FACT 69 DAYS----LAUNCHED 31 SATELLITES.

NOW THAT'S MORE SATELLITES IN SIXTY-NINE DAYS THEN WE'VE LAUNCHED IN THREE YEARS. THEY PUT THOSE SATELLITES EXACTLY WHERE THEY COULD MONITOR THE BRITISH ACTIVITIES. SO THE ABILITY TO LAUNCH QUICKLY AND PUT THOSE SATELLITES INTO POSITION TO MONITOR A TROUBLE SPOT IS A VERY, VERY IMPORTANT CAPABILITY. AND THEY WEREN'T JUST COMMUNICATIONS SATELLITES. THEY WERE----WHAT I WOULD CALL----WARFIGHTING SATELLITES. THEY WERE SATELLITES THAT TOOK PICTURES, THEY WERE SATELLITES THAT WERE DOING ELECTRONIC SNIFFING AND LOCATING SHIPS OVER THE SOUTH ATLANTIC LOCATING BRITISH SHIPS. AND THAT IS A VERY, VERY IMPORTANT CAPABILITY.

NOW LET ME GO BACK TO THE STATEMENT I MADE EARLIER. OUR SATELLITES ARE SO MUCH BETTER THAN THE SOVIETS! THEY'RE FINER GRAIN, LONGER LIVED, THEY SPEED INFORMATION TO THE PEOPLE WHO NEED THAT INFORMATION, SO MUCH MORE QUICKLY THAN THE SOVIETS DO. SO, WHY AM I TELLING YOU ALL THIS? WELL, THE REASON IS, IN 1972 THE SOVIETS DEVELOPED AN ANTISATELLITE SYSTEM. THEY DEVELOPED SOMETHING THAT WOULD SHOOT DOWN OUR SATELLITES.

NOW THERE ARE THREE RANGES OF SATELLITES. THERE ARE THOSE THAT ARE ABOUT 24,000 MILES IN SPACE, ABOUT THREE TIMES THE DIAMETER OF THE EARTH. THEY ARE RELATIVELY INVULNERABLE. THEN THERE ARE SATELLITES THAT ARE ABOUT 12,000 MILES ABOVE THE EARTH, ABOUT ONE AND ONE HALF TIMES THE DIAMETER OF THE EARTH, AND THEY'RE FAIRLY INVULNERABLE. THEN THERE ARE A LARGE GROUP OF SATELLITES THAT ARE, WELL, NOT MUCH FARTHER AWAY THAN CHARLOTTE, NORTH CAROLINA. SPACE ONLY STARTS AT 200 MILES ABOVE THE EARTH. YOU CAN DRIVE THERE IN THREE HOURS IF YOU COULD GO STRAIGHT UP----THAT IS LOW-EARTH ORBIT. THAT'S WHERE MOST OF OUR MILITARILY SIGNIFICANT SATELLITES ARE. AND THOSE ARE ALL VULNERABLE TO SOVIET ANTISATELLITE WEAPONS, NOT JUST ONE, BUT TWO AND THREE AND, IN FACT, EVEN FOUR. SO WHILE OUR SATELLITES ARE BETTER, THE SOVIETS HAVE DEVELOPED THE CAPABILITY TO SHOOT THEM DOWN.

NOW OUR NATIONAL STRATEGY IS ONE OF DETERRENCE. ONE OF DETERRING WAR, AND IF DETERRENCE FAILS, TO END THAT WAR ON TERMS FAVORABLE TO THE UNITED STATES AND HER ALLIES. WHY HAVEN'T WE APPLIED THAT DETERRENT

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PHILOSOPHY TO SPACE? WHY HAVEN'T WE DEVELOPED AN ANTISATELLITE SYSTEM OF OUR OWN THAT IS BETTER THAN THEIRS AND WOULD HOLD THEIR SATELLITES AT RISK, AND WOULD THEREFORE DETER THEM FROM SHOOTING OUR SATELLITES.

WE HAVEN'T DONE IT BECAUSE THE CONGRESS PASSED A LAW THAT SAID THAT WE COULD NOT TEST SUCH A SYSTEM. IF YOU CAN'T TEST SUCH A SYSTEM, THEN WHY WOULD MILITARY LEADERS, LIKE MYSELF, SPEND YOUR DOLLARS DEVELOPING SOMETHING THAT WE WOULD NEVER KNOW WHETHER OR NOT WOULD WORK AND PUT SOMETHING INTO PRODUCTION THAT WE DIDN'T KNOW WORKED. WELL, WE HAVEN'T DONE THAT. WE SAID THAT IF THE CONGRESS WON'T LET US TEST, OBVIOUSLY IT WOULD BE FOOLISH TO SPEND YOUR DOLLARS. AND WE HAVEN'T SPENT THEM.

WELL, THAT'S WHAT SENATOR HOLLINGS DID FOR US. HE LED THE CHARGE ON THAT, GOT THE TRUTH INTO THE SENATE. BECAUSE OF HIS ACTIONS ON THE PART OF THE SENATE, WE GOT THE TRUTH INTO THE HOUSE. CONGRESSMAN SPRATT AND OTHERS WORKED TO CONVINCE THE CONGRESS TO AGAIN PROHIBIT THE MILITARY FROM TESTING AN ANTISATELLITE WEAPON, THAT PROHIBITION WAS DEFEATED. NOW WE WILL BE ABLE TO DEVELOP A SYSTEM THAT WILL ALLOW YOUR SATELLITES TO LET US KNOW WHAT IS GOING ON IN THE WORLD, AND ALSO TO BE ABLE TO PROVIDE THAT INFORMATION TO OUR MILITARY TROOPS----SO

THAT WE COULD SAVE LIVES, SO THAT WE CAN PREVENT THE SOVIETS FROM EVER ATTACKING IN THE FIRST INSTANCE. WHEN YOU TALK ABOUT SAVING LIVES, IT REALLY SAVES LIVES. ONE OF THE SOVIET SATELLITES IS A GUN SIGHT AIMED AT EVERY ONE OF OUR SHIPS. AND IF THEY EVER PULL THE TRIGGER ON THAT GUN SIGHT, IT WILL DESTROY OUR SHIPS. IT WILL ENABLE LONG-RANGE CRUISE MISSILES TO DESTROY OUR SHIPS.

WELL, LET ME SHIFT GEARS AND TALK ABOUT SDI, JUST BRIEFLY, STRATEGIC DEFENSE INITIATIVE. AS THE COMMANDER OF THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND, THERE ARE ABOUT 20,000 PEOPLE WHO COME THROUGH MY HEADQUARTERS EACH YEAR. IN FACT, RECENTLY, AND QUITE OFTEN A GROUP FROM SUMTER OR FROM SOUTH CAROLINA COMES THROUGH. RECENTLY, GENERAL LESTIN MARSHON LED A GROUP THROUGH, AND I WAS DELIGHTED TO SEE HIM AGAIN. OF THOSE 20,000 PEOPLE, SOMETHING LIKE 19,500 BELIEVE THAT THIS COUNTRY HAS A MEANS OF DEFENDING ITSELF FROM BALLISTIC MISSILES. IT'S NOT TRUE. THE REASON----IN MARCH 1983----THAT THE PRESIDENT SAID, "WE NEED TO DO THAT," WAS BECAUSE HE

WAS SURE THAT THE TECHNOLOGY EXISTED TO DO THAT, AND THAT IT WAS TIME THAT AMERICA TOOK HER FUTURE INTO HER OWN HANDS. BECAUSE NOW THE FUTURE OF AMERICA IS IN THE HANDS OF THE SOVIETS. THEY HAVE THE ABILITY TO DESTROY US AT WILL, AND ALL WE CAN DO IS RETALIATE.

I THINK IT IS IMPORTANT, THAT WE AS PARENTS, THAT WE AS CITIZENS, THAT WE AS LEADERS IN THIS NATION HAVE THE DESTINY OF AMERICA IN OUR OWN HANDS, AND THE STRATEGIC DEFENSE INITIATIVE IS THE VEHICLE THAT WOULD DO THAT. NOW THERE ARE FOUR ARGUMENTS, AND MOST RECENTLY A FIFTH, OF WHY WE SHOULDN'T DO THAT. THE FIRST ARGUMENT IS THAT IT WON'T WORK. SECOND, THAT IT COSTS TOO MUCH. THIRD, IT WOULD INVITE THE SOVIETS TO ATTACK. THE FOURTH, THAT IT IS NOT LEAKPROOF. AND THE FIFTH, WHICH IS A VERSION OF THAT, IS IF WE CAN ONLY STOP 15,000 WARHEADS AND THERE ARE 35,000 MORE, WHAT GOOD IS IT.

WELL, LET ME TELL YOU WHAT THE ANSWERS TO THOSE ARGUMENTS ARE. FIRST, THAT IT WON'T WORK. BUT IT HAS BEEN DEMONSTRATED BY GENERAL ABRAHAMSON, THAT YOU CAN INTERCEPT A REENTRY VEHICLE IN SPACE----HE'S ALREADY DONE THAT. THE SOVIETS BELIEVE THAT IT WOULD WORK. THEY'VE INVESTED BILLIONS OF DOLLARS IN

DEVELOPING AND IMPROVING A SYSTEM THAT PROTECTS THE SOVIET UNION TODAY; SPECIFICALLY, MOSCOW AND ITS ENVIRONS. BUT THAT SYSTEM IS ENLARGING TO THE EXTENT THAT IT TAKES IN THE SOVIET UNION TO A GREATER DEGREE. SO THE SOVIETS KNOW IT CAN BE DONE----THEY DO IT.

WE HAVE A SATELLITE IN SPACE, CALLED THE SATELLITE EARLY WARNING SYSTEM. IT'S AN INFRARED SYSTEM THAT STARES DOWN AT THE EARTH AND WARNS US OF ATTACKS OF SOVIET BALLISTIC MISSILES. WE GET A LOT OF PRACTICE BECAUSE THEY LAUNCH ABOUT 600 SPACE LAUNCHES AND BALLISTIC MISSILES A YEAR. SO TWICE A DAY WE WATCH THE SOVIETS DO THAT, AND IT EXERCISES THE ENTIRE SYSTEM. SO THE BAD NEWS IS THAT THEY LAUNCH 600 TIMES, THE GOOD NEWS IS THAT WE SEE THEM ALL. SO WE'RE CERTAIN THAT IF THEY EVER ATTACK WE WOULD BE ABLE TO DETECT IT.

AN EMINENT GROUP OF SCIENTISTS RECENTLY MET, AND THEY WERE KIND OF NEGATIVE. THEY SAID THERE'S NO REASON WHY IT SHOULDN'T WORK, BUT THERE'S MORE RESEARCH REQUIRED. ANOTHER EMINENT GROUP OF SCIENTISTS MET AND SAID IT WILL WORK AND WE SHOULD BE READY TO FIELD THE SYSTEM SHORTLY. THERE IS NO LAW OF PHYSICS THAT SAYS THAT IT WON'T WORK.

NOW, AS TO THE ARGUMENT THAT IT COSTS TOO MUCH. THAT'S AN ARGUMENT THAT PREYS ON THE FEARS OF ALL OF US, BECAUSE CLEARLY, ALL INSTRUMENTS OF NATIONAL POLICY SPRING FROM A STRONG ECONOMY. WE'VE GOT TO HAVE A STRONG ECONOMY, AND WE IN THE MILITARY BELIEVE THAT. WE ALSO MUST HAVE THE MEANS OF DEFENDING THIS ECONOMY, AND WE SHOULD PAY WHATEVER IS NECESSARY TO DO THAT, AS LONG AS IT DOESN'T DESTROY THAT STRONG ECONOMY.

LET ME GIVE YOU AN EXAMPLE. IN THE 1960s WHEN PRESIDENT KENNEDY SAID, "WE'RE GOING TO PUT A MAN ON THE MOON IN THIS DECADE," WE SPENT SOMETHING LIKE $30 BILLION OF 1960 DOLLARS DOING THAT. ANYBODY THAT UNDERSTANDS DEPRECIATION OR INFLATION KNOWS THAT THAT $30 BILLION IN 1960 DOLLARS IS WORTH MORE THAN $100 IN 1990 DOLLARS, PROBABLY $150 BILLION. AT THE SAME TIME, WE WERE SPENDING $150 BILLION OF 1990 DOLLARS IN THOSE YEARS TO PUT A MAN ON THE MOON, WE HAD 300,000 TROOPS ON THE GROUND IN VIETNAM EXPENDING MUNITIONS AT AN ENORMOUS RATE. NOW, IF WE CAN FIGHT A WAR OF THAT MAGNITUDE AND PUT A MAN ON THE MOON, SEVERAL MEN ON THE MOON, WE CERTAINLY CAN DEFEND AMERICA. BECAUSE THE SAME DOLLARS THAT WE SPENT JUST FOR THE APOLLO PROGRAM COULD BE USED TO FIELD A PHASE I SYSTEM. SO IT DOESN'T COST TOO MUCH.

WE'LL INVITE THE SOVIETS TO ATTACK. WELL, THE ONLY THING I CAN SAY ABOUT THE SOVIETS IS I DON'T LIKE A LOT OF THINGS THEY DO, BUT I'VE NEVER FOUND THAT THEY'RE IRRATIONAL WHEN IT COMES TO THEIR OWN SURVIVAL. THE SOVIETS HAVE ALWAYS BACKED DOWN IN THE FACE OF THE THREAT AGAINST THE SOVIET UNION. THEY ARE NOT ABOUT TO DESTROY THEMSELVES BY ATTACKING US FOR SOMETHING THEY HAVE ALREADY DONE----AND THAT IS DEVELOP A DEFENSIVE SYSTEM. THE SOVIETS ARE NOT GOING TO RISK THEIR OWN DESTRUCTION. THEY'RE NOT GOING TO ACT IRRATIONALLY. SECRETARY GENERAL GORBACHEV IS NOT GOING TO WAKE UP SOME MORNING AND SAY, "LET'S ATTACK," BECAUSE IT WOULD INVITE THE DESTRUCTION OF THE NATION THAT HE'S TRYING TO PRESERVE. THEY WON'T ATTACK BECAUSE WE'RE DEVELOPING A STRATEGIC DEFENSE INITIATIVE.

NOT LEAKPROOF. IT DOESN'T HAVE TO BE LEAKPROOF. BESIDES, IF ANYBODY EVER TRIED TO SELL YOU A LEAKPROOF SYSTEM, YOU OUGHT TO PICK UP YOUR MONEY AND WALK AWAY FROM THE GAME, BECAUSE NOTHING IS EVER PERFECT. AND THIS SYSTEM WILL NOT BE PERFECT EITHER. IT DOESN'T HAVE TO BE LEAKPROOF. IT ONLY HAS TO ENSURE THAT THE INITIAL WARHEADS THAT THE SOVIETS WOULD ATTACK WITH----IF THEY EVER DID----WOULD BE DESTROYED. BECAUSE IT'S THOSE INITIAL WARHEADS THAT WOULD TRY AND CATCH OUR BOMBERS ON THE GROUND. IT'S THOSE INITIAL WARHEADS THAT WOULD TRY AND DESTROY OUR

ABILITY TO COMMUNICATE----FROM THE PRESIDENT TO THE RETALIATORY FORCES. IT'S THOSE INITIAL WARHEADS THAT WOULD TRY AND CAPTURE OUR ICBMs IN THE GROUND, AND THEREFORE, ENSURE SOVIET SYSTEM SURVIVABILITY. BUT IF THEY CAN'T GET THROUGH----IF SECRETARY GENERAL GORBACHEV IS ASSURED THAT THOSE WARHEADS WOULD BE DESTROYED----HE WOULDN'T ATTACK IN THE FIRST INSTANCE. WHAT IT DOES IS, IT INCREASES OUR DETERRENCE. IT INCREASES OUR ASSURANCE THAT THE SOVIETS WOULD NEVER ATTACK IN THE FIRST PLACE. OF COURSE, EQUALLY IMPORTANT IF NOT MORE IMPORTANT, IT DEFENDS AMERICA AGAINST THE INADVERTENT LAUNCH, THE ACCIDENTAL LAUNCH, AND THE LAUNCH BY A MADMAN.

WE RECENTLY READ HOW THE SAUDIS WERE ABLE TO BUY A SHORT-RANGE BALLISTIC MISSILE FROM THE CHINESE. THEY'VE GOT ENOUGH MONEY, THEY CAN BUY THEIR OWN MISSILE. AND I'M SURE THEY'VE GOT ENOUGH MONEY THAT THEY COULD HIRE SOME GERMAN, WHATEVER, SCIENTIST----THAT WOULD BE WILLING TO MAKE A NUCLEAR WEAPON. IT WOULD BE CRUDE. THE ACCURACY OF THE MISSILE WOULD BE POOR. BUT I THINK IT COULD FIND NORTH AMERICA. THEY MAY NOT BE ABLE TO AIM IT PRECISELY AT WASHINGTON DC, CHICAGO, OR NEW YORK----IT MIGHT LAND IN KANSAS CITY OR LITTLE ROCK. BUT WHEREVER IT LANDED, IT WOULD KILL HUNDREDS OF THOUSANDS OF AMERICANS AND WE CAN'T STOP IT. IF WE HAD EVEN THE EARLIEST DEPLOYMENT OF A STRATEGIC DEFENSE INITIATIVE, OR BALLISTIC MISSILE DEFENSE, WE COULD INTERCEPT AND STOP THAT WEAPON. WE HAVE NO DEFENSE TODAY.

NOW THE ARGUMENT, IT WOULD ONLY STOP 15,000 OF THOSE 49,000 WARHEADS THAT THE PRESIDENT IS TRYING TO NEGOTIATE DOWN TO IN THE STRATEGIC ARMS REDUCTION TALKS AND THEREFORE, THERE ARE ABOUT 35,000 OR 34,000 LEFT. WHAT DIFFERENCE DOES IT MAKE? WELL, AS I ALREADY EXPLAINED, IT'S THE INITIAL WARHEADS THAT, IF STOPPED, WOULD DETER THE SOVIETS IN THE FIRST INSTANCE. AND THEN YOU COULD BUILD THE SYSTEM OVER TIME TO WHERE IT WOULD STOP MORE AND MORE. BUT IT IS A VERY, VERY EFFECTIVE DETERRENT. I BELIEVE THAT WE----THAT THIS NATION----SHOULD TAKE THE STEPS TO FIELD ITS OWN DEFENSE.

LET ME LEAVE YOU WITH TWO THOUGHTS----THREE THOUGHTS. FIRST, FROM ALEXANDER SOLZHENITSYN. HE SAID THEN, AND IT'S STILL TRUE TODAY, "FREE MEN DO NOT KNOW THE VALUE OF THINGS." WHAT HE MEANT WAS THAT FREE MEN DO NOT KNOW THE VALUE OF FREEDOM, AND ALL TOO OFTEN WE FIND OTHER THINGS MORE IMPORTANT. WELL, I CAN ASSURE YOU THAT THERE IS NOTHING MORE IMPORTANT

THAN OUR FREEDOM AND OUR ABILITY TO PROTECT THE GREAT WAY OF LIFE THAT HAS BEEN DEVELOPED BY OUR FOREFATHERS----THE ENORMOUS BELIEF IN HUMAN DIGNITY, HUMAN RIGHTS, THE VALUE OF HUMAN LIFE, AND FREEDOM FOR OURSELVES AND OUR CHILDREN.

AND THEN THERE ARE THE WORDS OF REVEREND CAMPBELL PREACHING AT THE RIVERSIDE CHURCH. HE SAID, "WE'RE NOT WHAT WE USED TO BE, NOT WHAT WE OUGHT TO BE, NOT WHAT WE'RE GOING TO BE, BUT WE'RE MOVING." EVERY TIME I COME BACK TO SOUTH CAROLINA, AND TO SUMTER, I SEE THAT YOU'RE MOVING. I DROVE DOWN MAIN STREET AND GENYARD AND SAW SO MUCH DEVELOPMENT THAT I WAS SO PLEASED IN. AND I CAN JUST SEE THAT THE TOWN IS GROWING AND GROWING. NOT ONLY IN INDUSTRY BUT CERTAINLY IN QUALITY.

AND I WOULD LEAVE YOU WITH THE WORDS OF JOHN F. KENNEDY, WHO SAID, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG."

GOD BLESS YOU ALL FOR THE ROLE YOU PLAY IN KEEPING HER STRONG. THANK YOU VERY MUCH.

GENERAL JOHN L. PIOTROWSKI, USAF
JOSDEPS CONFERENCE
COLORADO SPRINGS, COLORADO
10 JUNE 1988

GOOD MORNING, AND FOR THOSE OF YOU WHO ARE FROM OUT OF TOWN, WELCOME TO COLORADO SPRINGS, NORAD, AND USSPACECOM.

FIRST, LET ME SAY THAT I AM TRULY APPRECIATIVE OF THE SUPPORT YOUR BOSSES HAVE GIVEN TO THE CONCEPT OF INTEGRATED STRATEGIC DEFENSE PLANNING. I THINK THERE IS HIGH PAYOFF IN APPROACHING OUR GROWING ABILITY TO DEFEND WITH THE BEST THOUGHT WE CAN ALL BRING TO BEAR.

BASED ON THE WORKLOAD MY OWN PLANNERS HAVE, I KNOW EACH OF YOU ALREADY HAVE A FULL PLATE. SO, I AM PARTICULARLY PLEASED THAT WE HAVE ALL THE COMMANDS ON THE FLAG OFFICER ADVISORY GROUP AND THE JCS REPRESENTED AND ALMOST 100 PERCENT WITH THE DESIGNATED MEMBERS. THAT'S REMARKABLE ON SUCH SHORT NOTICE. THANK YOU FOR ARRANGING THE TIME TO COME.

WE THINK YOUR TIME WILL BE WELL SPENT.

ON 8 JUNE 1965, RUSSELL BAKER WROTE IN THE OBSERVER COLUMN OF THE NEW YORK TIMES: "IN JUNE THE AIR IS FULL OF ADVICE. PEOPLE ARE GRADUATING, GETTING MARRIED, AND SETTING OUT ON VACATION, AND IT IS THE FATE OF THESE PEOPLE TO BE BATTERED WITH ADVICE UNTIL THEY SCREAM FOR MERCY." WE AREN'T GOING ON VACATION OR GETTING MARRIED, BUT IT IS AN APPROPRIATE TIME TO CONVENE THIS GROUP AND I INVITE YOU TO BATTER US WITH YOUR GOOD, SOUND ADVICE.

OUR PURPOSE FOR THIS INAUGURAL MEETING IS THREEFOLD. FIRST, WE WANT TO INFORM----TO PROVIDE INFORMATION THAT WILL ALLOW YOU TO BECOME CONVERSANT ABOUT STRATEGIC DEFENSE PLANNING. SECOND, WE WANT TO BEGIN A DIALOGUE THAT WILL ENSURE THE VIEWS OF ALL THE ORGANIZATIONS REPRESENTED HERE ARE RAISED, UNDERSTOOD, AND GIVEN FULL CONSIDERATION AS WE FORMALIZE THE PLANNING PROCESS. FINALLY, WE ARE SOLICITING YOUR IDEAS, COMMENTS ON OUR WORK TO DATE, AND OF COURSE, YOUR CONTINUED SUPPORT.

AS GENERAL WILLIAMS WILL DISCUSS IN MORE DETAIL LATER, AN INTEGRATED STRATEGIC DEFENSE PLANNING STAFF IS NOT MY ORIGINAL IDEA----BUT, YOU CAN BE SURE I STRONGLY EMBRACE THE CONCEPT FIRST INTRODUCED BY THE

VICE CHAIRMAN, GENERAL HERRES, IN BOTH MY WARFIGHTING AND SUPPORT ROLES. IN THE INTEREST OF WISELY COMMITTING OUR NATIONAL RESOURCES AND, IF NECESSARY, IN THE INTEREST OF EFFECTIVE WARFIGHTING WE SIMPLY MUST PLAN AND OPERATE OUR STRATEGIC DEFENSE FORCES IN CONCERT.

SO TODAY WE WOULD LIKE TO BRIEF YOU ON OUR CURRENT PLANNING EFFORTS FOR AIR DEFENSE, SPACE DEFENSE, AND BALLISTIC MISSILE DEFENSE. NORAD'S AIR DEFENSE PLANNING HAS BEEN CONDUCTED SINCE THE 1950s, BUT WE ARE INCORPORATING NEW CAPABILITIES IN INTELLIGENCE, SENSORS, COMMAND/CONTROL AND COMMUNICATIONS, AND WEAPONS.

SPACE DEFENSE PLANNING IS RELATIVELY NEW, AND OF COURSE, IS BASED ON A VERY LIMITED CAPABILITY TODAY. BALLISTIC MISSILE DEFENSE IS IN THE CONCEPT STAGE, BUT IT IS AN EXTREMELY BUSY ENTERPRISE.

HAVING PRESENTED THOSE BRIEFINGS ON THE PLANNING FOR THREE MISSION ELEMENTS OF STRATEGIC DEFENSE, WE WILL DISCUSS OUR FIRST DRAFT, OR STRAWMAN, FOR A HIGHER LEVEL, OVERARCHING PLAN: THE INTEGRATED STRATEGIC DEFENSE PLAN OR ISDP. THE ISDP IS DESIGNED TO PROVIDE THE FOUNDATION OR GUIDANCE FOR INTEGRATING OUR STRATEGIC DEFENSE EFFORTS BOTH IN DETERMINING REQUIREMENTS AND IN OPERATIONAL PLANNING.

IN ADDITION, WE WOULD LIKE TO PRESENT A SUMMARY OF THE ANALYTICAL TOOLS CURRENTLY AVAILABLE TO SUPPORT OUR PLANNING AND ANALYSIS AND DISCUSS THE TOOLS NEEDED FOR ANALYSIS OF AN INTEGRATED DEFENSE.

AND, WHILE I HAVE YOU HERE, I WILL TAKE THE OPPORTUNITY TO DISCUSS USSPACECOM'S CAMPAIGN PLAN WITH YOU. WHILE IT GOES BEYOND STRATEGIC DEFENSE, IT PROVIDES A MILITARY OPERATIONAL VIEW ABOUT THE CAPABILITIES AND VULNERABILITIES OF OUR SPACE SYSTEMS THAT I WANT TO SHARE WITH YOU.

NOW, LET ME SAY A FEW WORDS ABOUT THE WHY OF THIS MEETING TODAY.

OBVIOUSLY, THE PRINCIPAL CATALYST FOR THE GROWING INTEREST IN STRATEGIC DEFENSE IS THE VERY REAL TECHNOLOGICAL POSSIBILITY OF FIELDING AN EFFECTIVE DEFENSE AGAINST BALLISTIC MISSILES. BUT AS YOU WELL KNOW, A BALLISTIC MISSILE DEFENSE SYSTEM----EVEN A PERFECT ONE CANNOT PERFECTLY DEFEND THE U.S. AND ITS CRITICAL ASSETS. WE ALSO MUST BE CONCERNED ABOUT LONG-RANGE BOMBERS, CRUISE MISSILES, ASATs, DIRECTED ENERGY WEAPONS, AND SO FORTH. IN THE LONGER TERM, WE MAY HAVE TO DEFEND AGAINST SPACE-BASED WEAPONS, NAVAL, AND LAND FORCES.

MY POINT IS THAT IF WE ARE TO MOVE FROM AN ALMOST TOTAL RELIANCE ON DETERRENCE BASED ON THE THREAT OF RETALIATION TO ONE BASED ON AN EFFECTIVE DEFENSE AND THE OFFENSIVE CAPABILITY TO TERMINATE A CONFLICT ON FAVORABLE TERMS, WE MUST BEGIN NOW TO THINK ABOUT THE IMPLICATIONS OF THAT POLICY CHANGE ON OUR COMMITMENTS, OUR STRATEGY, OUR MISSIONS, OUR OPERATIONAL PLANS, AND THE FORCE STRUCTURE WE WILL REQUIRE.

WE MUST TAKE EVERY OPPORTUNITY TO EXPLORE OUR OBJECTIVES AND MISSION AND DEVELOP SYSTEMS THAT HAVE NEEDED CHARACTERISTICS:

---- MULTI-CAPABLE SYSTEMS.

---- AFFORDABLE.

---- DESIGNED TO BE ABLE TO WORK IN CONCERT.

---- ENDURING AND FLEXIBLE IN MEETING A CHANGING THREAT.

WE MUST PLAN TO INTEGRATE EFFORTS NOT ONLY AMONG STRATEGIC DEFENSE MISSION ELEMENTS, BUT BETWEEN THE OFFENSE AND DEFENSE. FINALLY, WE MUST ANALYZE OUR DECISIONS AND DIRECTION FROM AN INTEGRATED PERSPECTIVE.

THAT'S A TOUGH TASK. IT HAS NOT PROVEN TO BE A PARTICULARLY POPULAR ONE BECAUSE OF FEARS REGARDING TREADING ON ESTABLISHED TURF OF OUR WARFIGHTING CINCs, SERVICES, AND SDIO; RELUCTANCE TO CREATE ANOTHER ORGANIZATION IN AN ENVIRONMENT OF MANPOWER AND FUNDING CUTS; AND SENSITIVITY OF OUR PARTNER ON DEFENSE, CANADA, REGARDING SDI AND SPACE OPERATIONS.

THE LATTER ISSUE IS PARTICULARLY DIFFICULT AND SENSITIVE. OBVIOUSLY, WE CANNOT INTEGRATE OUR DEFENSES WITHOUT CONSIDERING NORAD'S CONTRIBUTION. YET, WE CANNOT ENGAGE NORAD IN PLANNING FOR BMD OR SPACE OPERATIONS WITHOUT THE SEVERE RISK OF EMBARRASSING THE CANADIAN GOVERNMENT OR EVEN BREAKING OUR BINATIONAL NORAD AGREEMENT. SO WE HAVE TO PROTECT OR INSULATE CANADA AND NORAD. WE ARE DOING THAT BY REQUESTING NORAD INPUTS AND HAVING U.S. ELEMENT NORAD REVIEW, COORDINATE THE SENSITIVE PLANNING AREAS. AND, WE WILL DO OUR BEST TO MAKE AS MUCH OF OUR INTEGRATED PLANNING RELEASABLE TO THE CANADIAN GOVERNMENT AS WE CAN.

I HOPE THAT WE CAN MEET AT SOME FUTURE DATE WITH AN AGENDA THAT WOULD BE BENEFICIAL TO SHARE WITH OUR CANADIAN PARTNERS.

IN THE MEANTIME, MY FOCUS IS ON ESTABLISHING A COMMON UNDERSTANDING AND EXCHANGING VIEWS WITHIN THE U.S. MILITARY COMMUNITY.

I'M DELIGHTED YOU ARE HERE AND LOOK FORWARD TO DISCUSSING OUR CAMPAIGN PLAN LATER THIS MORNING.

GENERAL JOHN L. PIOTROWSKI, USAF
CONUS NORAD REGION CHANGE OF COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA
1 JULY 1988

GENERAL RUSS, GENERAL ADAMS, GENERAL PIERSON----DISTINGUISHED GUESTS----MEN AND WOMEN OF THE FIRST AIR FORCE----LADIES AND GENTLEMEN----PATRIOTS ALL!

AS WRITTEN IN THE SCRIPTURES, THERE IS A TIME FOR ALL SEASONS----A TIME TO PLANT AND A TIME TO HARVEST. LIKEWISE IN THE MILITARY THERE IS A TIME TO COME----AND A TIME TO GO.

A CHANGE OF COMMAND ALWAYS EVOKES STRONG EMOTIONS.

UNIT PRIDE ON THE PART OF ALL CONCERNED.

A FEELING OF SADNESS IN LEAVING OLD FRIENDS.

CHALLENGES YET UNRESOLVED.

AN OVERWHELMING FEELING OF COMMITMENT AS THE MANTLE OF RESPONSIBILITY FALLS ON ONE'S SHOULDERS.

THOSE FEELINGS AND MORE ARE ABUNDANT TODAY AS WE PAUSE TO HONOR GENERAL ADAMS AND GENERAL PIERSON----TWO SUPERB COMMANDERS AND LEADERS.

WE HAVE JUST HEARD GENERAL RUSS TALK ABOUT THE MERIT OF AN INDIVIDUAL AS DEMONSTRATED BY THE MARK HE LEAVES ON AN ORGANIZATION. UNDER THE ABLE STEWARDSHIP OF GENERAL ADAMS, THE FIRST AIR FORCE, AND THE CONUS NORAD REGION HAVE SIGNIFICANTLY IMPROVED IN OVERALL FORCE STRUCTURE BY APPLYING WHAT ARE COMMONLY KNOWN AS THE "FOUR PILLARS" OF MILITARY FORCES----READINESS, SUSTAINABILITY, FORCE STRUCTURE, AND MODERNIZATION----TO OUR AIR DEFENSE AND AIR SURVEILLANCE FORCES. LET ME GIVE SOME EXAMPLES OF THIS APPLICATION DURING GENERAL ADAMS SHORT TENURE.

WITH THE INTRODUCTION OF IMPROVED TACTICS, THE AUTOMATION OF THE REGIONAL OPERATIONAL COMMAND CENTER AND THE IMPROVEMENTS IN INTEROPERABILITY AMONG U.S. NAVY, CANADIAN, AND ICELANDIC FORCES, THE CONUS NORAD REGION IS IN ITS HIGHEST STATE OF READINESS IN MANY YEARS. THE EFFORTS DIRECTED BY GENERAL ADAMS TO INCREASE SUSTAINABILITY BY INTRODUCING WAR READINESS SUPPLY KITS WILL, WITHOUT QUESTION, CONTRIBUTE TO OUR CAPABILITY TO DEPLOY FORCES AND SUSTAIN THEM IN FORWARD BASES. THE INTRODUCTION OF THE FIRST OVER-THE-HORIZON BACKSCATTER RADARS, NOW OPERATIONALLY EMPLOYED BY GENERAL ADAMS, REPRESENTS

TODAY'S STATE-OF-THE-ART AIR SURVEILLANCE CAPABILITY NECESSARY TO PROTECT OUR COASTLINES AND CONTROL OUR AIRSPACE. THESE RADARS ALONG WITH THE CONVERSION OF OUR F-106 SQUADRONS TO F-15s AND F-16s HELP TO MODERNIZE AND ENHANCE OUR FORCE STRUCTURE TO MEET THE ENEMY THREAT.

I CAN'T OVEREMPHASIZE THE NEED TO CONTINUE WHAT GENERAL ADAMS HAS UNDERTAKEN. OUR PRINCIPAL ADVERSARY, THE SOVIET UNION, ROUTINELY DEPLOYS FLIGHTS OF STRATEGIC BOMBERS OFF OUR COASTS. THESE AIRCRAFT ARE ARMED WITH LONG-RANGE, STANDOFF WEAPONS----PRIMARILY CRUISE MISSILES-----WHICH MAKE THE JOB OF ALL OF OUR AIR DEFENDERS THAT MUCH HARDER. THE CHALLENGES ASSOCIATED WITH THE EXECUTION OF THE AIR DEFENSE MISSION ARE CRUCIAL TO THE NATION----GENERAL ADAMS DESERVES CREDIT FOR RISING TO MEET THESE CHALLENGES HEAD-ON AND ENSURING WE ARE PREPARED TO DEAL WITH THEM.

I KNOW ALL OF YOU JOIN ME AND THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND STAFF IN WISHING GENERAL ADAMS AND OUIDA, GODSPEED AND BEST WISHES IN THEIR NEW ASSIGNMENT AS THE VICE COMMANDER OF THE TACTICAL AIR COMMAND HERE AT LANGLEY.

I AM ALSO PLEASED TO WELCOME GENERAL PIERSON, WHO IS WELL KNOWN TO MOST OF YOU. THROUGHOUT HIS CAREER, HE'S BEEN A KEY PLAYER IN THE AIR DEFENSE OF OUR NATION----MOST RECENTLY AS THE CHIEF OF THE JOINT U.S. MILITARY ADVISORY GROUP IN GREECE----AND HE HAS MY COMPLETE ENDORSEMENT. HE BRINGS A RICH BACKGROUND OF COMMAND, STAFF, AND TACTICAL FIGHTER EXPERIENCE TO THE CONUS NORAD REGION----AND I AM CERTAIN THAT IT WILL CONTINUE TO GROW AND EXCEL UNDER HIS MOST CAPABLE LEADERSHIP.

GENERAL PIERSON----WE WISH YOU AND SANDRA EVERY SUCCESS IN YOUR NEW COMMAND.

GENERAL JOHN L. PIOTROWSKI, USAF
TEXAS AFA STATE CONVENTION
KERRVILLE, TEXAS
23 JULY 1988

PRESIDENTS KEITH AND RUSSELL, GENERAL DONNELLY, ALL THE GENERAL OFFICERS, FELLOW MEMBERS, LADIES AND GENTLEMEN, DISTINGUISHED GUESTS, FELLOW AIRMEN, FRIENDS AND PATRIOTS ALL; IT'S REALLY GREAT TO BE WITH YOU TONIGHT; I REALLY APPRECIATE THE OPPORTUNITY. THANK YOU SO MUCH FOR INVITING ME. IT'S GREAT TO BREAK BREAD IN THE SPIRIT OF FRIENDSHIP AND FELLOWSHIP AND WITH THE CONCERNS OF THE NATION ON OUR MIND.

I WANT TO COVER TWO SUBJECTS. BUT BEFORE THAT I WANT TO ASK EVERYBODY IN THIS AUDIENCE TO DO ME A FAVOR. ALLOW ME TO TELL YOU WHAT A GREAT YOUTH MOVEMENT THERE IS IN THE UNITED STATES AND HOW BLESSED WE ARE AS SENIOR MILITARY LEADERS TO HAVE THE FINE YOUNG MEN AND WOMEN COMING INTO THE MILITARY AND CIVIL SERVICE SUPPORTING THE DEFENSE OF THIS GREAT NATION. I KNOW YOU SAW SOME OF THE TOP REPRESENTATIVES OF THAT GROUP HERE TONIGHT. RIGHTFULLY SO, WE ACKNOWLEDGE THE GREAT WORK THEY'RE DOING. WE HAVE BY ANY MEASURE, BY ANY

STANDARD, THE FINEST YOUNG AMERICAN MEN AND WOMEN, BOTH OFFICER AND ENLISTED, COMING INTO THE SERVICE. I CAN SPEAK KNOWLEDGEABLY ABOUT THE AIR FORCE, NAVY, ARMY, AND MARINES BECAUSE WE HAVE ALL OF THEM IN OUR COMMAND AND THEY ARE JUST SUPERB.

SO AS YOU GO ABOUT YOUR BUSINESS IN THE GREAT STATE OF TEXAS, PLEASE TELL THE MOTHERS AND FATHERS OF THIS STATE WHAT A SUPER JOB THEY ARE DOING IN RAISING THEIR CHILDREN; THEY ARE MORE AWARE, BETTER EDUCATED, MORE COMMITTED, AND KNOW WHY THEY ARE IN THE SERVICE OF THEIR COUNTRY----BECAUSE IT'S IMPORTANT. THEY BELIEVE IN WHAT THEY ARE DOING; THEY ARE COMMITTED TO WHAT THEY ARE DOING. WE'RE SO BLESSED TO HAVE THEM AND THEY MAKE MY JOB SO EASY.

TODAY, I WANT TO TALK ABOUT TWO THINGS. THE U.S. MILITARY SPACE PROGRAM AND WHERE IT IS OR WHERE IT NEEDS TO GO AND SOME OF THE PROBLEMS WHICH PLAGUE IT. I NEED TO START OUT BY TELLING YOU THAT WE HAVE ABSOLUTELY SUPERB SPACECRAFT. THEY ARE THE FINEST THAT EXIST IN SPACE TODAY. THEY ARE LONG LIVED AND FINE GRAINED. THEY DO AN ABSOLUTELY SUPERB JOB IN PROVIDING THE INFORMATION THAT OUR NATIONAL LEADERS, OUR MILITARY LEADERS AND OUR FORCES IN THE FIELD NEED.

THEY DO THREE THINGS EXTREMELY WELL. THEY PROVIDE SURVEILLANCE DATA----SUCH AS WEATHER SURVEILLANCE OR SURVEILLANCE OF BALLISTIC MISSILE LAUNCHES FROM THE SOVIET UNION AND FROM THE OCEANS. THEY PROVIDE VERY PRECISE NAVIGATION: AN EXAMPLE OF THAT IS IN THE MINESWEEPING OPERATIONS IN THE PERSIAN GULF USING THE NEW GLOBAL POSITIONING SYSTEM, A SYSTEM WHICH IS STILL IN THE FINAL STAGES OF DEVELOPMENT.

TODAY, WE HAVE SEVEN GPS SPACECRAFT UP THERE, AND WE PROVIDE GROUND POSITION INDICATORS TO THE NAVY'S MINESWEEPING FORCE. ONE OF THE MOST DIFFICULT THINGS IN MINESWEEPING IS TO KNOW EXACTLY WHERE THE MINESWEEPER IS SO THAT YOU DON'T HAVE TO RETRACE YOUR STEPS OR GO OVER AND OVER AGAIN A BODY OF WATER TO MAKE SURE THAT YOU SWEPT IT THOROUGHLY. IF YOU KNOW PRECISELY WHERE YOU ARE, CHART A COURSE, DO A MINE SWEEP, AND BE SURE THAT YOU HAVE SWEPT ALL THE WATERS YOU HAVE BECOME EXTREMELY EFFECTIVE. AS A RESULT OF HAVING THIS PRECISE NAVIGATION, THE MINESWEEPING FORCE HAS BEEN REDUCED WHILE THEIR EFFECTIVENESS HAS BEEN INCREASED. SO NAVIGATION IS ONE OF OUR STRONG SUITS AS IS COMMUNICATIONS.

AS A RESULT OF THE GREAT WORK THAT WE CAN DO IN SPACE AND THE LARGE COVERAGE THAT WE CAN PROVIDE BY OUR SPACECRAFT, WE'VE REDUCED THE NUMBER OF TERRESTRIAL FORCES REQUIRED TO DO SURVEILLANCE, NAVIGATION, AND COMMUNICATIONS AND WE RELY VERY HEAVILY ON SPACE. SO OUR SPACECRAFT ARE VERY GOOD AT WHAT THEY DO AND THEY SUPPORT OUR PRESIDENT, NATIONAL AUTHORITIES, SUCH AS THE SECRETARY OF DEFENSE AND THE SECRETARY OF STATE; AND THEY SUPPORT OUR FORCES.

SO WHAT IS THE PROBLEM? WELL, THEY ARE AT RISK. THEY ARE AT RISK FROM THE SOVIET UNION. THE SOVIETS ARE GROWING MIGHTILY IN SPACE WHILE WE HAVE TENDED TO FLOUNDER AFTER THE SHUTTLE TRAGEDY AND SOME OTHER PROBLEMS WITH OUR SPACE BOOSTERS. WE'RE DIGGING OUR WAY OUT OF THAT. THIS FALL WE WILL BE LAUNCHING THE TITAN SPACECRAFT, THE NEW DELTA BOOSTER; WE'LL BE LAUNCHING CRITICAL SATELLITES ON THOSE BOOSTERS. IT'S BECAUSE OF THE GREAT QUALITY, REDUNDANCY, AND RELIABILITY BUILT INTO OUR SPACECRAFT THAT WE HAVE BEEN ABLE TO SURVIVE THE CHALLENGER TRAGEDY AND ABLE TO CONTINUE OUR IMPORTANT WORK IN SPACE. BUT THE SOVIETS HAVEN'T STOOD STILL.

LET ME JUST TICK OFF SOME NUMBERS FOR YOU. IN 1987, THE SOVIETS LAUNCHED 98 SPACECRAFT----WE LAUNCHED NINE, THE FRENCH LAUNCHED ELEVEN. SO IN TERMS OF LAUNCHES, THE UNITED STATES IS THIRD IN THE WORLD. THE SOVIETS HAVE LAUNCHED OVER 2,000 SATELLITES SINCE SPUTNIK WENT UP ON 4 OCTOBER 1957. THE UNITED STATES LAUNCHED LESS THAN 1,000. NOW, OF COURSE, WE DON'T HAVE TO LAUNCH AS MANY SATELLITES AS THE SOVIETS DO BECAUSE OURS ARE SO GOOD AND LONG LIVED. BUT THERE IS A QUALITY IN THE QUANTITY THAT THE SOVIETS HAVE. IT GIVES THEM ROBUSTNESS, IT GIVES THEM RESILIENCE. THEY HAVE A GREATER PRODUCTION BASE. THEY LAUNCHED, IN FACT, MORE SATELLITES IN DECEMBER 1987 THAN THE UNITED STATES LAUNCHED IN THE LAST TWO YEARS. THAT GIVES YOU AN IDEA OF THEIR CAPABILITY.

LET ME GIVE YOU ANOTHER BENCHMARK. DURING THE FALKLANDS WAR IN THE 1982, THE SOVIETS TOOK AN INTEREST IN WHAT THE BRITISH WERE DOING DOWN OFF THE COAST OF ARGENTINA. THEY PURPOSELY LAUNCHED 28 SATELLITES IN A PERIOD OF 69 DAYS. NOW THAT IS MORE THAN WE'VE LAUNCHED IN THE LAST THREE YEARS. THOSE SATELLITES WERE DESIGNED TO TAKE ADVANTAGE OF MONITORING THE BRITISH ACTIVITIES----LISTENING TO THEIR

COMMUNICATIONS, MONITORING, PHOTOGRAPHING THEIR ACTIVITIES, AND THE LIKE. VERY, VERY PURPOSEFUL ACTIVITY ON THE PART OF THE SOVIETS TO GAIN KNOWLEDGE ABOUT HOW THE BRITISH FIGHT WAR; ESPECIALLY THEIR MODERN AIRCRAFT OFF THE BRITISH AIRCRAFT CARRIERS THEY HAD OFF THE COAST OF ARGENTINA.

ANOTHER INTERESTING BENCHMARK WHICH CONCERNS THE FALKLANDS----THE SOVIETS HAVE DOUBLED THEIR NUMBER OF SPACECRAFT SINCE THAT TIME. WE HAVE REMAINED RELATIVELY CONSTANT. SO THEY HAVE SIGNIFICANTLY MORE SPACECRAFT IN SPACE TODAY THAN WE DO.

NOW, ONE OF THE REASONS THEY DO WHAT THEY DO----LAUNCH SO OFTEN AND MAINTAIN A LARGE SPACE ORDER OF BATTLE AS WE CALL IT----IS BECAUSE THEY ARE TECHNOLOGICALLY POOR. THEY DON'T HAVE THE LARGE-SCALE INTEGRATED TECHNOLOGY THAT WE HAVE. THEY DON'T HAVE THE SMALL COMPUTERS THAT WE HAVE. SO THEY CAN'T DO WHAT WE DO; THEY ARE AT LEAST 10 YEARS BEHIND US BUT THEY MAKE UP FOR THAT LACK OF TECHNOLOGY BY DEMONSTRATING A GREAT ROBUSTNESS IN THEIR LAUNCH INFRASTRUCTURE. THEY HAVE PROBABLY FIVE TIMES AS MANY PEOPLE IN THE SPACE BUSINESS, TWICE AS MANY LAUNCH PADS----THEY'RE IN IT IN A BIG WAY. THEY

ALSO HAVE AN ANTISATELLITE CAPABILITY. THEY HAVE A CO-ORBITAL----OR WHAT I CALL A KILLER SATELLITE----SYSTEM THAT FLIES IN FORMATION WITH ITS TARGET, CLOSES ON THE TARGET, AND THEN FIRES A HUGE SHOTGUN SHELL WHICH RIDDLES THE TARGET WITH SHRAPNEL AND DESTROYS IT. THEY NOT ONLY HAVE THE CO-ORBITAL KILLER SATELLITE BUT THEY HAVE HIGH POWERED LASERS----SEVERAL OF THEM. THEY ARE EXPERIMENTING WITH CHARGED PARTICLE BEAMS AND OTHER SYSTEMS THAT WOULD BE INIMICAL TO OUR SATELLITES.

IN ADDITION, THEY HAVE AN ANTIBALLISTIC MISSILE SYSTEM WHICH CAN ALSO BE USED AS AN ANTISATELLITE WEAPON. SO ONE REASON WE NEED TO MOVE FORWARD ON A COUPLE OF IMPORTANT PROGRAMS IN OUR OWN SPACE PROGRAM IS BECAUSE THE SOVIETS CAN KNOCK OUR SATELLITES OUT. WE RELY ON OUR SPACECRAFT TO CARRY OUT OUR MILITARY RESPONSIBILITIES AND TO PROVIDE INDICATIONS AND WARNING OF ATTACKS AGAINST THE UNITED STATES AND AGAINST NORTH AMERICA.

WE NEED TO BUILD A SYSTEM THAT WILL HOLD SOVIET SATELLITES AT RISK SO THAT THEY WON'T ATTACK OURS. WE WANT TO USE THE SAME STRATEGY IN SPACE THAT HAS BEEN SO EFFECTIVE IN PROTECTING AMERICA AND THAT IS THE STRATEGY OF DETERRENCE. WE WANT TO DETER THE SOVIETS FROM ATTACKING OUR SYSTEM BY HAVING THE CAPABILITY TO ATTACK THEIRS. WE ALSO NEED TO DEVELOP

A GREATER ROBUSTNESS IN OUR SPACE STRUCTURE BECAUSE IF WE EVER GET INTO A CONFLICT WITH THE SOVIET UNION OR A SURROGATE WITH THE SOVIET UNION, THEY COULD ATTACK OUR SYSTEMS AND WE WOULD NEED TO REPLENISH THEM. THESE ARE VERY, VERY IMPORTANT PROGRAMS. THEY'RE ALMOST AS IMPORTANT AS TEXAS FOOTBALL. IT'S WITH GREAT RELUCTANCE I SAY THAT.

NOW THE SECOND THING I WANT TO TALK ABOUT IS BALLISTIC MISSILE DEFENSE. THERE ARE 19,000 PEOPLE THAT COME THROUGH MY COMMAND POST EACH YEAR. ABOUT 18,950 OF THOSE PEOPLE BELIEVE THAT THE UNITED STATES HAS THE ABILITY TO DEFEND ITSELF. THEY'RE SHOCKED WHEN THEY FIND OUT THAT WE DON'T HAVE A BALLISTIC MISSILE DEFENSE. AS YOU KNOW, THE PRESIDENT EMBARKED IN MARCH 1983 ON A PROGRAM CALLED THE STRATEGIC DEFENSE INITIATIVE TO BUILD A BALLISTIC MISSILE DEFENSE. THAT PROGRAM HAS GONE FORWARD. A VERY TALENTED GENTLEMAN, GENERAL JIM ABRAHAMSON, IS IN CHARGE OF THAT. HE HAS MADE GREAT STRIDES IN DEVELOPING THE TECHNOLOGY WE NEED TO BE ABLE TO INTERCEPT BALLISTIC MISSILES AS THEY ARE LAUNCHED, AS THEY CRUISE ACROSS THE POLES, OR AS THEY DESCEND ON THE UNITED STATES.

BUT THERE ARE FOUR RATHER DEMAGOGIC ARGUMENTS AGAINST BALLISTIC MISSILE DEFENSE. VERY SIMPLY, THEY ARE FIRST----IT WON'T WORK, SECOND----IT'S TOO COSTLY, THIRD----IT WOULD INVITE THE SOVIETS TO ATTACK, AND LASTLY----IT'S NOT LEAKPROOF. WELL, LET ME COMMENT JUST BRIEFLY ON EACH OF THOSE FOUR SPECIOUS BUT FALLACIOUS ARGUMENTS.

FIRST, THAT IT WON'T WORK. THAT'S NOT TRUE. IT HAS ALREADY BEEN PROVEN BOTH BY GENERAL ABRAHAMSON'S TEAM AND MANY YEARS EARLIER IN THE DEVELOPMENT OF THE ANTISATELLITE THAT ONE CAN INTERCEPT A BALLISTIC MISSILE REENTRY VEHICLE. I THINK THE GREATEST PROOF IS WHAT THE SOVIETS HAVE RINGING MOSCOW. THEY'VE HAD A BALLISTIC MISSILE DEFENSE FOR 20 YEARS. OUR INFRARED SATELLITE IN SPACE THAT DETECTS THEIR BALLISTIC MISSILE LAUNCHES ALSO DETECTS THEIR TESTING OF THAT SYSTEM. WE HAVE OBSERVED THEIR TESTS THROUGH THAT SYSTEM AND IT WORKS. LET ME REPEAT----THEY HAVE A WORKABLE BALLISTIC MISSILE DEFENSE SYSTEM. NOW . . . THERE ARE SOME SCIENTISTS THAT WOULD ARGUE THAT IT NEEDS MORE WORK----AND THAT'S PROBABLY TRUE. AND THERE ARE SOME SCIENTISTS THAT SAY THAT IT WON'T WORK. BUT NOBODY CAN FIND A LAW IN PHYSICS THAT PREVENTS IT. IT WILL WORK. THERE IS NO REASON WHY IT WON'T WORK BECAUSE WE AND THE SOVIETS HAVE PROVEN THAT IT CAN.

SECOND, IT COSTS TOO MUCH. YOU MAY RECALL THAT EARLY IN THE 1960s, PRESIDENT KENNEDY GALVANIZED THIS NATION TO EMBARK ON A JOURNEY TO THE MOON----AND WE DID. THAT PROGRAM COST AMERICANS ABOUT $30 BILLION IN 1960 DOLLARS. IF YOU APPRECIATE THOSE 1960 DOLLARS FORWARD INTO THE MID-90s, WE'RE TALKING ABOUT A PROGRAM THAT COSTS $140 TO $150 BILLION IN 1990 DOLLARS. THAT'S A LITTLE MORE THAN WHAT IT WOULD COST TO DEPLOY THE FIRST PHASE OF A BALLISTIC MISSILE DEFENSE SYSTEM. SO IF THIS NATION WAS WILLING TO LAND ON THE MOON, AND MAKE THAT FIRST SMALL STEP TAKEN BY MAN----THAT FIRST GREAT STEP FOR MANKIND----WE SHOULD BE WILLING TO SPEND THE SAME AMOUNT OF MONEY TO DEFEND OUR SOCIETY, OUR FUTURE, OUR CHILDREN, AND OUR WAY OF LIFE.

NOW, I NEED TO REMIND YOU THAT AT THE SAME TIME WE WERE GOING FORWARD TO THE MOON AND SPENDING $30 BILLION, WE HAD OVER 300 THOUSAND TROOPS ON THE GROUND IN VIETNAM. WE HAD A LARGE NUMBER OF AIR WINGS IN THAILAND, VIETNAM, AND OTHER PLACES. WE WERE EXPENDING AMMUNITION AT AN EXTRAORDINARY RATE. THIS NATION CAN AFFORD TO DEFEND ITSELF IF IT CAN DO THESE THINGS IN THE SIXTIES. IT DOESN'T COST TOO MUCH TO DEFEND AMERICA.

THIRD, IT WOULD INVITE THE SOVIETS TO ATTACK. TRULY A DEMAGOGIC ARGUMENT. IT'S CLEAR THAT THE SOVIETS ARE RATIONAL WHEN IT COMES TO THEIR OWN SURVIVAL. THE SOVIETS WOULD NOT ATTACK THE UNITED STATES ABSENT AN ENORMOUS CRISIS WHICH WOULD PUSH THEM TO THE BRINK. THEY WOULD NOT INVITE THEIR OWN DESTRUCTION. CERTAINLY, THEY KNOW THAT THE STRATEGIC AIR COMMAND, THE PACIFIC AND ATLANTIC COMMANDS, AND THE EUROPEAN COMMAND WITH THEIR CAPABILITIES COULD DESTROY THE SOVIET SOCIETY IN TURN. SO THEY WOULDN'T ATTACK JUST BECAUSE WE ARE DEVELOPING A SYSTEM TO DEFEND OURSELVES; A SYSTEM WHICH THEY HAVE ALREADY DEVELOPED AND DEPLOYED AND ARE IMPROVING AT A RAPID RATE. SOVIETS ARE RATIONAL WHEN IT COMES TO THEIR OWN SURVIVAL.

THE LAST ARGUMENT IS THAT THE SYSTEM WOULD NOT BE LEAKPROOF. IT DOESN'T HAVE TO BE LEAKPROOF. IN ORDER TO INCREASE THE DETERRENT VALUE----IN ORDER TO BE ABLE TO PREVENT THE SOVIETS FROM EVER CONSIDERING ATTACKING IN THE FIRST INSTANCE----IT DOESN'T HAVE TO BE LEAKPROOF. IT JUST HAS TO BE ABLE TO DESTROY THE FIRST WEAPONS THAT ARE COMING OUR WAY AND CERTAINLY DESTROY THE MAJORITY OF WEAPONS THAT ARE SENT AGAINST US. BECAUSE THE FIRST WEAPONS WOULD BE DIRECTLY AGAINST NORTH AMERICA, THEY WOULD BE DIRECTLY AGAINST WASHINGTON AND THE PRESIDENT'S ABILITY TO PROVIDE DIRECTION. THEY WOULD BE DIRECTED

AGAINST OMAHA AND GENERAL CHAIN'S ABILITY TO GET THE WORD OUT TO HIS FORCES. THEY WOULD BE DIRECTED AGAINST MY HEADQUARTERS TO PREVENT US FROM GETTING THE WARNING OUT TO THE NATION AND THE WORLD THAT WE WERE UNDER ATTACK. SO IT DOESN'T HAVE TO BE LEAKPROOF.

SO . . . IT WILL WORK. IT DOESN'T COST TOO MUCH. IT WON'T INVITE THE SOVIETS TO ATTACK. AND IT DOESN'T HAVE TO BE LEAKPROOF.

THERE IS ONE OTHER IMPORTANT POINT AND THAT IS THAT BECAUSE OF BUDGET CUTS, THE STRATEGIC DEFENSE INITIATIVE HAS BEEN DIRECTED TOWARD A GROUND-BASED INTERCEPT SYSTEM---AND THAT'S GOOD; THAT'S A VERY IMPORTANT PART OF THE SYSTEM. BUT WHAT REALLY GIVES US LEVERAGE IS A SPACE-BASED SYSTEM THAT WOULD SHOOT AT BALLISTIC MISSILES AS THEY ARE LEAVING THE SOVIET UNION. THAT GIVES US A LEVERAGE OF EIGHT TO ONE, TEN TO ONE, FOURTEEN TO ONE, BECAUSE FOR ONE INTERCEPT VEHICLE, WE CAN DESTROY EIGHT TO FOURTEEN WARHEADS AND DESTROY THEM ALL WHILE THEY'RE STILL CLUSTERED TOGETHER. SO . . . IT IS IMPORTANT THAT WE GO FORWARD WITH THE SPACE-BASED PROGRAM.

I BELIEVE THAT AMERICA CAN AFFORD TO DEFEND ITSELF. I'M FULLY CONVINCED THAT THE PRESIDENT'S VISION OF PRESERVING THE FUTURE OF AMERICA FOR OUR CHILDREN AND OUR WAY OF LIFE IS A VIABLE THING. BALLISTIC MISSILE DEFENSES WILL CERTAINLY ASSURE THAT ONE, THE SOVIETS WOULD NEVER ATTACK AND TWO, IT WOULD PROTECT US FROM THE CRAZIES AND THE MADMEN IN THE WORLD LIKE THE QADDAFIS AND THE KHOMEINIS.

YOU REALIZE BY JUST READING THE PAPER THAT BALLISTIC MISSILE PROLIFERATION IS GOING ON AT AN INCREASINGLY GREATER PACE. JUST RECENTLY, WE READ THAT SAUDI ARABIA PURCHASED INTERMEDIATE-RANGE BALLISTIC MISSILES FROM CHINA. I'M SURE IF THE PRICE IS RIGHT, THEY CAN BUY INTERCONTINENTAL BALLISTIC MISSILES. SO CAN QADDAFI AND KHOMEINI AND OTHER PEOPLE WHO HAVE ACCESS TO THE WORLD'S OIL RICHES.

LET ME LEAVE YOU WITH TWO THOUGHTS. ONE FROM REVEREND CAMPBELL AT THE RIVERSIDE CHURCH IN NEW YORK----AND I'M SPEAKING ABOUT OUR MILITARY, ABOUT OUR NATION, ABOUT SPACE COMMAND----WHEN I PARAPHRASE HIM. HE SAID, "WE'RE NOT WHAT WE USED TO BE, NOT WHAT WE'RE GOING TO BE, NOT WHAT WE OUGHT TO BE, BUT WE'RE MOVING." AND SO IS THE AFA.

IN THE WORDS OF JOHN F. KENNEDY AT HIS INAUGURAL ADDRESS, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE WILL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG." LET'S STOP AND THINK ABOUT IT. WE CAN AFFORD TO BE STRONG. WE CANNOT AFFORD TO BE WEAK.

GOD BLESS THE AFA AND ALL OF YOU FOR DOING ALL YOU CAN TO MAKE AND KEEP AMERICA STRONG. THANK YOU SO MUCH FOR HAVING ME HERE.

GENERAL JOHN L. PIOTROWSKI, USAF
AIR UNIVERSITY AND AIR WAR COLLEGE
SPACE SYMPOSIUM
MAXWELL AFB, ALABAMA
26 JULY 1988

IT'S A PLEASURE TO BE HERE WITH YOU THIS EVENING AT THE FIRST ANNUAL SPACE SYMPOSIUM. I BELIEVE THAT THIS CONFERENCE----JOINTLY SPONSORED BY AIR UNIVERSITY AND THE AIR WAR COLLEGE----IS A SIGNIFICANT INITIATIVE, AND ONE THAT COULD YIELD EXTREMELY IMPORTANT BENEFITS----NOT ONLY FOR THE DEPARTMENT OF DEFENSE, BUT ALSO FOR THE "SPACE COMMUNITY" AS A WHOLE.

NOTE THAT I SAID "COULD" YIELD EXTREMELY IMPORTANT BENEFITS, AND NOT "SHOULD" OR "WILL" YIELD THEM. THAT LARGE SUBJECT CALLED "SPACE"----AND ITS SUBSETS OF SPACE LEADERSHIP, SPACE GOALS, AND SPACE CAPABILITIES----HAVE ALL BEEN THE FOCUS OF LITERALLY HUNDREDS OF SYMPOSIA, CONFERENCES, SPECIAL STUDIES, AND HIGH-LEVEL MEETINGS OVER THE PAST SEVERAL YEARS. WHILE SOME WOULD SINCERELY ASSERT TO YOU, THAT WE----THE MEMBERS OF THE SPACE COMMUNITY----ARE MAKING REMARKABLE PROGRESS IN DEFINING, AND THEN MEETING OUR NATION'S CIVIL, COMMERCIAL, AND MILITARY

SPACE GOALS, I----ON THE OTHER HAND----WILL SUGGEST TO YOU TONIGHT THAT WHILE WE HAVE BEEN LONG ON DISCUSSION, WE HAVE BEEN CONSIDERABLY SHORTER ON ACTION. LET ME ELABORATE ON THAT RELATIVELY SIMPLE THEME BY ASKING YOU TO REFLECT ON THREE POINTS.

FIRST, WE MAY HAVE BEEN THE VICTIMS OF OUR OWN SUCCESS IN SPACE. BY THAT I MEAN, THAT OUR TECHNOLOGICAL SUPERIORITY----LARGELY THE BY-PRODUCT OF OUR INVESTMENT IN THE APOLLO PROGRAM----HAS LED US TO BUILD A SPACE INFRASTRUCTURE THAT IS BETTER SUITED TO THE REQUIREMENTS OF COST EFFECTIVENESS IN PEACETIME, THAN IT IS SUITED TO THE REQUIREMENT FOR OPERATIONAL EFFECTIVENESS AND SURVIVABILITY IN WARTIME.

OUR MILITARILY SIGNIFICANT SPACECRAFT----WHEN VIEWED OBJECTIVELY OR THROUGH THE EYES OF AN ADVERSARY----ARE CUNNINGLY CONTRIVED, BUT THEY ARE ALSO LUCRATIVE AND VULNERABLE TARGETS. WHILE THEIR COMPLEXITY AND TECHNOLOGICAL SOPHISTICATION CERTAINLY ENABLES THEM TO HANDLE HIGHER DATA RATES MORE QUICKLY THAN THE SPACECRAFT OF ANY OTHER NATION IN THE WORLD, IT ALSO REQUIRES THAT THEY BE LARGE. LARGE SPACECRAFT REQUIRE LARGE BOOSTERS, AND LARGE BOOSTERS AND COMPLEX SYSTEMS MARRIED TOGETHER REQUIRE LONG PROCESSING AND INTEGRATION TIMES----RESULTING IN WHAT IS LARGELY A "ONE-DEEP"

FORCE STRUCTURE THAT IS NEITHER QUICKLY NOR EASILY RECONSTITUTED OR REINFORCED. OUR MARVELOUS PEACETIME SPACE FORCE IS, REGRETTABLY, PRESENTLY NOT WELL-SUITED TO ENDURABILITY IN A STRESSED ENVIRONMENT----STRESSED ENVIRONMENT IS, AS YOU MIGHT SUSPECT, A EUPHEMISM FOR WAR----SPACE WAR.

THE SOVIETS, FULLY APPRECIATING BOTH THE VULNERABILITY OF OUR SPACE FORCES AND OUR DEPENDENCE ON THEM, HAVE CONSCIENTIOUSLY AND METHODICALLY SET ABOUT TO DEVELOP THE ANTISATELLITE CAPABILITIES, REQUISITE TO HOLDING THIS SPACE FORCE AT RISK----AT ALL ALTITUDES, IN ALL WEATHER CONDITIONS, WITH MULTIPLE PHENOMENOLOGIES, AND WITH CAPABILITIES THAT SPAN THE SPECTRUM FROM MERE HARASSMENT TO PROMPT PHYSICAL DESTRUCTION. AND THE SOVIETS HAVE BEEN, TO A LARGE DEGREE, SUCCESSFUL IN THEIR EFFORT TO PUT OUR SPACECRAFT AT RISK!

WHILE WE CAN TAKE GREAT PRIDE IN THE PROWESS OF OUR PEACETIME SPACE CAPABILITY, WE NEED TO REEVALUATE WHETHER OR NOT WE CAN SUSTAIN OUR SPACE FORCE ACROSS THE SPECTRUM OF CONFLICT. I HAVE SERIOUS DOUBTS THAT WE CAN. SO, THE FIRST POINT THAT I WOULD LIKE YOU TO REFLECT ON IS THAT "WINNING THE PEACE" DOES NOT MEAN THAT WE CAN PRESERVE THE PEACE, NOR DOES IT MEAN THAT WE WILL BE ABLE TO USE SPACE TO CONTRIBUTE TO MEETING OUR OBJECTIVES SHOULD DETERRENCE FAIL.

THE SECOND POINT IS THAT WE NEED TO DISTINGUISH BETWEEN DIRECT SUPPORT TO OUR FORCES AND THOSE SERVICES WHICH ARE BY-PRODUCTS OF OTHER ACTIVITIES. I DOUBT THAT THERE IS ANYONE IN THIS ROOM WHO IS NOT CONVINCED THAT SPACE SYSTEMS SERVE OUR NATIONAL SECURITY NEEDS, BY ENHANCING THE FORCES THAT RELY ON THEM. ALL OF US HERE ACCEPT THAT AS A TRUTH. YET, THE MILITARILY SIGNIFICANT SPACE SYSTEMS THAT OUR NATION POSSESSES----WHICH DIRECTLY SERVE OUR DETERRENT AND WARFIGHTING FORCES----ARE VERY FEW IN NUMBER. ASIDE FROM COMMUNICATIONS SATELLITES AND A HANDFUL OF NAVIGATIONAL SPACECRAFT, THE SATELLITES THAT DIRECTLY DOWNLINK TO OUR WARFIGHTING FORCES CAN BE NUMBERED ON THE HAND OF A CARELESS CARPENTER.

MOREOVER, ALL OF OUR SPACE LOGISTICS CAPABILITY RESIDES IN THE HANDS OF THE RESEARCH AND DEVELOPMENT COMMUNITY, AND NOT IN THE HANDS OF THE APPROPRIATE LOGISTICS COMMANDS. OUR SPACE LAUNCH CAPABILITY, FOR EXAMPLE, IS EXCLUSIVELY IN THE HANDS OF THE DEVELOPER, RATHER THAN BEING IN THE HANDS OF THE OPERATOR. AND WHILE SYSTEMS COMMAND PERFORMS THIS IMPORTANT FUNCTION ADMIRABLY, THEY DO IT WITH A DIFFERENT MIND-SET----WITHOUT REGARD FOR THE FOUR PILLARS OF DEFENSE: READINESS, SUSTAINABILITY, FORCE STRUCTURE, AND MODERNIZATION.

IN MY OWN HOUSE, OUR SPACE SURVEILLANCE SYSTEM----THE TARGET IDENTIFICATION AND ACQUISITION SYSTEM FOR ANY FUTURE SPACE CONTROL CAPABILITY----IS A CONTRACTOR-INTENSIVE OPERATION THAT HAS NO JCS-MANDATED SUSTAINABILITY REQUIREMENTS. IN SIMPLE TERMS, THAT MEANS THAT WE HAVE CONSCIOUSLY ACCEPTED THE LIKELIHOOD THAT OUR SPACE SURVEILLANCE CAPABILITY WILL NOT SURVIVE AFTER THE SHOOTING STARTS. THIS NEEDS TO BE CORRECTED AND HAS OUR HIGHEST PRIORITY.

AS A NATION, WE NEED TO STOP GIVING LIP SERVICE TO THE IMPORTANCE OF SPACE TO OUR NATION'S DETERRENT AND WARFIGHTING CAPABILITY. IF SPACE IS IMPORTANT TO OUR MILITARY FORCES----AND IT IS----THEN WE NEED TO STRUCTURE THOSE FORCES, OPERATE THEM AND EMPLOY THEM IN A WAY WHICH ACKNOWLEDGES THAT IMPORTANCE. WE HAVE NOT DONE THAT, AND I AM NOT CONFIDENT THAT WE ARE EVEN MOVING IN THAT DIRECTION.

MY THIRD, AND FINAL POINT REALLY EMBRACES THE OTHER TWO. IT IS, THAT SPACE IS NEITHER SO UNIQUE NOR SO SPECIAL THAT WE CAN SAFELY PERSIST IN TREATING IT AS THE ALMOST-EXCLUSIVE REALM OF SCIENTISTS, ENGINEERS, AND FUTURISTIC POLICY MAKERS. WE SAY THAT "SPACE IS A PLACE," BUT YET IT IS A PLACE THAT IS GOVERNED BY A SET OF POLICIES WITHOUT ANALOGS ON THE LAND, AT SEA, OR IN THE AIR. IF IT IS A PLACE WHERE MILITARY FORCES CAN, SHOULD, AND MUST OPERATE IN SUPPORT OF NATIONAL

SECURITY, THEN WE OUGHT TO CHALLENGE THE IDEA THAT IT HAS A SPECIAL MYSTIQUE, AND APPROACH IT IN THE SAME SENSIBLE WAYS IN WHICH WE HAVE APPROACHED OTHER OPERATING MEDIA.

WE OUGHT ALSO TO STRUCTURE OUR MILITARY SPACE FORCES USING THE SAME OVERWHELMING LOGIC THAT ASSISTS US IN STRUCTURING FORCES THAT OPERATE ON LAND, AT SEA, UNDER THE SEA, AND IN THE AIR. THE PILLARS OF THOSE OTHER FORCES ARE FORCE STRUCTURE, READINESS, SUSTAINABILITY, AND MODERNIZATION. FOR SOME REASON, WE CONTINUE TO EXEMPT SPACE FORCES FROM MEETING THOSE REQUIREMENTS. YET, IF WE APPROACHED SPACE FORCES AS WE DO OUR OTHER MILITARY FORCES, WE WOULD BE DRIVEN TO ENHANCE THEIR CAPABILITIES. EMBRACING THAT RATHER SIMPLE, STRAIGHTFORWARD APPROACH IS PROBABLY THE SINGLE MOST IMPORTANT THING WE CAN DO FOR OUR NATION IN SPACE.

IF YOU WILL REFLECT ON THOSE THREE POINTS AND USE THEM AS A TOUCHSTONE----OR MORE PROFANELY, BUT PERHAPS MORE ACCURATELY, AS A "GUT CHECK"---- THROUGHOUT THIS SYMPOSIUM, THEN MAYBE THIS SERIES OF MEETINGS WILL INDEED BE UNIQUE. MAYBE THIS SYMPOSIUM WILL RESULT IN A COMMITMENT TO ACTING INSTEAD OF A

COMMITMENT TO CONTINUE DISCUSSING----IF WE DON'T ACT SOON AND RESOLUTELY, THE MILITARY BALANCE IN SPACE WILL CONTINUE TO SHIFT, SURELY IRREVOCABLY IN THE FAVOR OF OUR ADVERSARIES.

THIS SYMPOSIUM STRIVES FOR A "CONSENSUS." A CONSENSUS, I REMIND YOU, REPRESENTS "BROAD" OR "GENERAL" AGREEMENT, NOT "TOTAL" OR "COMPLETE" AGREEMENT. IF YOU AGREE THAT OUR TECHNOLOGICAL SUPERIORITY GIVES US TREMENDOUS LEVERAGE . . . IF YOU AGREE THAT SPACE SYSTEMS CAN AND SHOULD DO A BETTER JOB OF MORE DIRECTLY SERVING THE NEEDS OF OUR DETERRENT AND WARFIGHTING FORCES . . . AND IF YOU BELIEVE THAT SPACE IS A PLACE FROM, IN, AND THROUGH WHICH ACTIVITIES IN SUPPORT OF NATIONAL SECURITY CAN, DO, AND MUST TAKE PLACE . . . THEN I AM CONFIDENT YOU WILL BE MOTIVATED TO SET IN MOTION THAT CHAIN OF EVENTS THAT COULD----AND I BELIEVE MUST----RESULT IN A MORE RESPONSIVE, ROBUST, AND RATIONAL SPACE FORCE STRUCTURE.

REVEREND CAMPBELL . . . .

JOHN F. KENNEDY . . . .

GENERAL JOHN L. PIOTROWSKI, USAF
ARMED FORCES COMMUNICATION
AND ELECTRONICS ASSOCIATION
U.S. AIR FORCE ACADEMY
COLORADO SPRINGS, COLORADO
9 AUGUST 1988

SYMPOSIUMS RELATED TO SPACE ARE QUITE FREQUENT OCCURRENCES THESE DAYS. THESE GATHERINGS----WHETHER SPONSORED BY THE AIR UNIVERSITY, THE SOCIETY OF LOGISTICS ENGINEERS, OR THE ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION----CAN YIELD EXTREMELY IMPORTANT BENEFITS. NOT ONLY FOR THE DEPARTMENT OF DEFENSE, BUT ALSO FOR THE ENTIRE "SPACE COMMUNITY", AND, INDEED, FOR THE NATION.

THERE ARE THOSE WHO WILL SINCERELY AND EMPHATICALLY ASSERT THAT THE SPACE COMMUNITY HAS MADE REMARKABLE PROGRESS IN DEFINING, AND THEN MEETING OUR NATION'S CIVIL, COMMERCIAL, AND MILITARY SPACE GOALS. I BELIEVE----ON THE OTHER HAND----THAT WE HAVE BEEN LONG ON DISCUSSION, BUT SHORT ON THE DECISIONS AND ACTIONS NECESSARY TO PROVIDE SUSTAINED, OPERATIONAL MILITARY CAPABILITIES IN SPACE.

OUR CURRENT SPACE INFRASTRUCTURE----TO INCLUDE THE COMMAND, CONTROL, AND COMMUNICATION FUNCTIONS, AND OUR ON-ORBIT FORCE STRUCTURE----IS, FROM A WARFIGHTING VIEWPOINT, VICTIM OF OUR TECHNOLOGY. ALTHOUGH OUR SCIENTISTS AND ENGINEERS, HAVE CLEARLY DEVELOPED A TECHNICAL SUPERIORITY IN SPACE, OUR SPACE SYSTEMS----AND THE INFRASTRUCTURE THAT BUILDS THEM, LAUNCHES THEM, AND OPERATES THEM----ARE CLEARLY BEST SUITED TO THE ENVIRONMENT OF PEACE.

OUR SPACE SYSTEMS CONSIST OF LARGE, MULTIFUNCTION SPACECRAFT WHICH ARE LUCRATIVE AND VULNERABLE TARGETS. FURTHERMORE, WE HAVE MARRIED THESE COMPLEX SPACECRAFT TO COMPLEX LAUNCH AND SUPPORT SYSTEMS, RESULTING IN LENGTHY PRELAUNCH PROCEDURES AND EXTENSIVE ON-ORBIT CHECKOUT AND CALIBRATION REQUIREMENTS. WE'VE ALSO LINKED THESE COMPLEX SPACECRAFT TO COMPLEX AND LARGELY UNDEFENDED GROUND STATIONS ESSENTIAL TO MAINTAIN THE ON-ORBIT HEALTH OF THE SATELLITE, AND TO COLLECT, PROCESS, AND RELAY DATA VITAL TO OUR DETERRENT AND WARFIGHTING FORCES AROUND THE WORLD. OUR SPACE SYSTEMS TODAY ARE ESSENTIALLY A "ONE-DEEP" FORCE STRUCTURE THAT CANNOT BE EASILY RECONSTITUTED OR REINFORCED DURING THE STRESSES IMPOSED BY WAR.

HAVING ASSERTED THAT WE MIGHT BE FOUND LACKING IN TERMS OF A WARTIME OPERATIONAL CAPABILITY IN SPACE----LET ME OFFER A SET OF CRITERIA THAT SHOULD BE USED IN DEVELOPING THIS ESSENTIAL CAPABILITY.

IN DEVELOPING MILITARY SPACE CAPABILITIES, WE SHOULD APPLY THE SAME SENSIBLE, "TESTED-IN-WAR" CRITERIA WE USE TO DEVELOP OUR LAND, SEA, AND AIR FORCES. THESE CRITERIA ARE; FORCE STRUCTURE, . . . SUSTAINABILITY, . . . READINESS, . . . AND MODERNIZATION. MEASURED AGAINST THESE CRITERIA, OUR CURRENT SPACE SYSTEMS WOULD BE FOUND LACKING IN A SHOOTING WAR.

TO ILLUSTRATE HOW THESE CRITERIA WILL CHANGE OUR SPACE SYSTEMS, LET ME DIGRESS FOR A MOMENT AND USE AS AN EXAMPLE A SYSTEM THAT WILL SIGNIFICANTLY ENHANCE THE CAPABILITIES OF OUR MILITARY FORCES AND THE COMMAND AND CONTROL OF THOSE MILITARY FORCES.

AS MANY OF YOU KNOW, I AM A STRONG ADVOCATE OF A SPACE-BASED RADAR SYSTEM. I FIRMLY BELIEVE SUCH A SYSTEM OFFERS CAPABILITIES THAT WE MUST HAVE TO RETAIN OUR DETERRENT CAPABILITY AND TO EFFECTIVELY EMPLOY OUR MILITARY FORCES AROUND THE WORLD.

I MENTIONED THAT A SPACE-BASED RADAR WILL ENHANCE THE COMMAND AND CONTROL OF MILITARY FORCES. LET ME TAKE A MOMENT TO EXPAND ON THAT THOUGHT BEFORE I GET BACK TO THE CRITERIA FOR OPERATIONAL CAPABILITIES IN SPACE.

TODAY WE EMPLOY OUR FORCES, WHETHER AIR, SEA, OR LAND ELEMENTS, BASED ON DATA THAT IS OFTEN SEVERAL HOURS, PERHAPS EVEN DAYS OLD. FURTHERMORE, DATA USED FOR CRITICAL EMPLOYMENT DECISIONS DURING WARTIME IS GENERALLY SKETCHY AT BEST. THESE DECISIONS ARE TAKEN BASED ON SUSPECTED LOCATIONS OF THE ENEMY. THE GROUND COMMANDER DEPLOYS HIS TANKS WITHOUT ACCURATE KNOWLEDGE OF THE LOCATION OF ENEMY AIRCRAFT. THE CARRIER BATTLE GROUP COMMANDER MUST CONSTANTLY SURVEIL THE OCEAN WITH FLEET RESOURCES TO DEFEND HIS FORCES. TODAY OUR ONLY ALTERNATIVE IS TO MAKE DECISIONS BASED ON LARGELY UNCERTAIN KNOWLEDGE ABOUT THE ENEMY FORCE.

IT HAS BEEN SAID THAT A SPACE-BASED RADAR WILL MAKE "THE ENTIRE WORLD A FISH BOWL." THAT'S NOT VERY FAR FROM TRUE. A SPACE-BASED RADAR WILL ALLOW US TO DETECT AND TRACK FIGHTER-SIZED AIRCRAFT AT TAKEOFF AND TO DETECT, CLASSIFY, AND THEN TRACK SHIPS OF INTEREST. IT WILL DO THIS WITH NEAR PERFECT PROBABILITIES OF DETECTION, VIRTUALLY ON A REAL-TIME BASIS, IN ALL WEATHER, DAY OR NIGHT AROUND THE GLOBE.

THIS WILL CLEARLY CHANGE THE NATURE OF THE COMMAND AND CONTROL OF THE FORCES WE EMPLOY. BY DISSIPATING THE FOG OF WAR, SPACE-BASED RADAR WILL ALLOW BATTLEFIELD COMMANDERS TO EMPLOY THEIR FORCES AT THE RIGHT PLACE, AT THE RIGHT TIME, AND IN THE RIGHT PROPORTION. BECAUSE THIS SYSTEM OFFERS SO MANY ADVANTAGES, WE MUST USE THE PROPER CRITERIA IN ITS DEVELOPMENT. AS AN ASIDE, WHEN WE LOOKED AT THE COST OF THE LATE 1990s POTENTIAL THREAT FORCE STRUCTURE----WE FOUND AN ESTIMATED 350 BILLION DOLLARS PLUS WORTH OF STRATEGIC AND TACTICAL AIR AND MARITIME ASSETS. TO KEEP CONTINUOUS TRACK OF ALL THOSE MILITARY CRAFT FOR LESS THAN 10 BILLION DOLLARS IS GOOD LEVERAGE----MAKES ENORMOUS SENSE.

AS WE DEVELOP AND VALIDATE SPACE-BASED RADAR OPERATIONAL REQUIREMENTS, DESIGN THE "C-CUBED" ARCHITECTURE, MOVE FROM PLANNING, TO PROGRAMMING, AND FINALLY TO PRODUCTION AND DEPLOYMENT, OUR DECISIONS MUST BE EVALUATED AGAINST THE CRITERIA OF FORCE STRUCTURE, SUSTAINABILITY, READINESS, AND MODERNIZATION.

SPACE-BASED RADAR----AND ALL SPACE SYSTEMS FOR THAT MATTER----SHOULD EMPLOY A LEVEL OF AUTONOMY, IN TERMS OF MISSION DATA PROCESSING AND AUTO-NAVIGATION, AND SATELLITE CROSS-LINKS TO REDUCE DEPENDENCE ON

GROUND STATIONS. DOWNLINKS AND UPLINKS SHOULD BE JAM-RESISTANT AND SURVIVABLE IN A NUCLEAR ENVIRONMENT. THESE FEATURES ARE ESSENTIAL TO ENSURE SUSTAINABILITY.

TO BE CONSIDERED "READY," THE SYSTEM MUST HAVE A HIGH DEGREE OF ON-BOARD PROCESSING OF DATA. THIS INFORMATION MUST BE DIRECTLY DOWNLINKED TO THE BATTLEFIELD COMMANDER. THE BEST WAY TO EARN THEATER COMMANDERS' SUPPORT FOR SPACE SYSTEMS IS TO PROVIDE DIRECT DOWNLINK OF REAL-TIME, USABLE DATA DIRECT TO THE FORCES THAT NEED IT AND USE IT IN PREPARING FOR AND WINNING BATTLES. THE SYSTEM MUST ALSO BE AGILE ENOUGH TO ADJUST TO THE CHANGING TACTICAL SITUATIONS AROUND THE WORLD. SEVERAL OTHER FACTORS ALSO AFFECT READINESS AND SUSTAINABILITY.

MOST OF OUR CURRENT SPACE "C-CUBED" SYSTEMS ARE FRAGILE AND VULNERABLE, THEREFORE, HARDLY SUSTAINABLE. THESE SYSTEMS ARE GENERALLY SINGLE STRING, AND AS SUCH, PROVIDE LITTLE REDUNDANT, OR BACKUP, CONTROL OF OUR SPACECRAFT. THEY ARE ALSO HEAVILY DEPENDENT ON OVERSEAS GROUND STATIONS. WE MUST DEVELOP "C-CUBED" SYSTEMS THAT FUNCTION AS AN INTEGRATED WHOLE, RATHER THAN AS ISOLATED, UNIQUE PARTS. WE MUST AGGRESSIVELY PURSUE INTEROPERABILITY. WE MUST

ALSO HAVE SURVIVABLE COMMAND AND CONTROL LINKS BETWEEN THE OPERATIONAL FORCES AND THOSE WHO APPORTION AND CONTROL SPACE ASSETS IN WARTIME. OUR LAUNCH INFRASTRUCTURE ALSO FAILS THE READINESS AND SUSTAINABILITY REVIEW.

OUR LAUNCH SYSTEMS ARE NOT FLEXIBLE. CURRENT SPACECRAFT ARE BY AND LARGE COMPATIBLE WITH ONLY A SINGLE BOOSTER TYPE AND OFTEN WITH A SPECIFIC BOOSTER WITHIN THAT TYPE. OUR BOOSTERS AND SPACECRAFT SHOULD BE DESIGNED SO THAT ANY SPACECRAFT OF A WEIGHT BELOW THE DESIGN WEIGHT OF A BOOSTER TYPE CAN FLY ON ANY BOOSTER OF THAT TYPE. SUSTAINABILITY AND READINESS CONSIDERATIONS SHOULD DRIVE US TO EMPLOY ASSEMBLY LINE PRODUCTION TECHNIQUES; . . . STANDARDIZED DOCUMENTATION AND TRAINING; . . . COMMON CONNECTORS AND ATTACH FITTINGS; . . . AND SIMPLIFIED CHECKOUT AND LAUNCH PREPARATION. WE MUST BE ABLE TO REPLACE THOSE SPACECRAFT THAT FALL VICTIM TO ENEMY ATTACK, AND WE MUST BE ABLE TO LAUNCH SPACECRAFT AS DEMANDED BY SHIFTS IN THE TACTICAL SITUATION.

WE HAVE BUILT SUPERIOR SPACECRAFT. THEY SERVE US WELL IN PEACETIME, BUT WE MUST UPGRADE THEIR READINESS AND SUSTAINABILITY IN WAR. READINESS, SUSTAINABILITY, FORCE STRUCTURE, AND MODERNIZATION ARE THE CRITERIA WE MUST APPLY AS WE ENHANCE AND DEVELOP OUR CAPABILITY TO OPERATE IN SPACE----TO SUPPORT AND

DISCRIMINATINGLY DEPLOY OUR MILITARY FORCES WORLDWIDE. THAT IS THE BOTTOM LINE AND SHOULD BE YOUR BOTTOM LINE----DEVELOP AND DEPLOY SYSTEMS THAT SUPPORT THE BATTLEFIELD COMMANDERS----SYSTEMS BASED ON THE CRITERIA OF SUSTAINABILITY, READINESS, FORCE STRUCTURE, AND MODERNIZATION.

GENERAL JOHN L. PIOTROWSKI, USAF
PERMIAN BASIN PETROLEUM ASSOCIATION
MIDLAND, TEXAS
19 AUGUST 1988

THANK YOU FOR YOUR WARM WELCOME AND THIS GREAT EVENING. TEXAS HOSPITALITY CONTINUES TO BE WITHOUT EQUAL.

ACKNOWLEDGMENTS . . . .

I WEAR TWO MILITARY HATS----ONE FOR THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND (NORAD) AND ONE FOR THE UNITED STATES SPACE COMMAND. NORAD, A COMBINED COMMAND THAT EMPLOYS U.S. AND CANADIAN FORCES, IS RESPONSIBLE FOR ATTACK WARNING AND AIR DEFENSE OF NORTH AMERICA. U.S. SPACE COMMAND IS RESPONSIBLE FOR MILITARY SPACE OPERATIONS. THAT IS WHERE I WILL FOCUS MY COMMENTS THIS EVENING.

AS A UNIFIED COMMAND, THREE COMPONENT COMMANDS ARE ASSIGNED TO USSPACECOM----THE ARMY, NAVAL, AND AIR FORCE SPACE COMMANDS. THEY ACQUIRE, ORGANIZE, TRAIN, EQUIP, AND SUSTAIN SPACE FORCES. WITH THAT BACKGROUND, I'LL BRIEFLY ADDRESS THE COMMAND'S MISSIONS----SPACE CONTROL AND SPACE SUPPORT----AND THE IMPORTANCE OF DEVELOPING SPACE SYSTEMS WITH AN OPERATIONAL FOCUS.

SPACE SUPPORT IS ANALOGOUS TO AIRLIFT SUPPORT. USSPACECOM PROVIDES SERVICES CRITICAL TO THE SUCCESS OF MILITARY FORCES WORLDWIDE----JAM RESISTANT COMMUNICATIONS, PRECISION NAVIGATIONAL PARAMETERS, REAL-TIME WEATHER INFORMATION, AND MAPPING DATA. IN SHORT, SPACE SUPPORT EXPLOITS THE FORCE-MULTIPLIER OPPORTUNITIES INHERENT IN SPACE.

QUITE NATURALLY, SPACE SUPPORT ALSO REQUIRES THAT THE U.S. BE ABLE TO LAUNCH SATELLITES. AS YOU KNOW, OUR LAUNCH VEHICLES HAVE BEEN "SHORT-STOPPED" BY FAILURES, BUT WE ARE CLEARLY MOVING FORWARD. WE ARE RECOVERING FROM DECISIONS TAKEN IN THE SIXTIES AND SEVENTIES-----NEVER AGAIN WILL THE U.S. DEPEND ON A SINGLE LAUNCH VEHICLE. THE SHUTTLE WILL BE LAUNCHED LATER THIS YEAR, BUT SO WILL THE TITAN II, THE TITAN IV, AND THE DELTA II; THE ATLAS II WILL BE OPERATIONAL IN THE EARLY 1990s; AND AN ADVANCED LAUNCH SYSTEM IS BEING DEVELOPED. NEVERTHELESS, WE ARE STILL TEXAS MILES AWAY FROM THE READY AND SUSTAINABLE LAUNCH INFRASTRUCTURE NEEDED FOR WARTIME SUPPORT TO U.S. MILITARY FORCES.

CURRENT U.S. SPACECRAFT ARE REALLY A "GOOD NEWS . . . BAD NEWS" STORY. THE GOOD NEWS----THESE SATELLITES ARE CLEARLY TECHNICAL WONDERS. THEIR FIDELITY AND RELIABILITY FAR EXCEED THAT OF SOVIET

SYSTEMS. IN FACT, THE RELIABILITY OF OUR SATELLITES CARRIED THIS COUNTRY THROUGH THE PERIOD OF LAUNCH SHUTDOWNS. THE GOOD NEWS IS VERY GOOD, THE BAD IS VERY BAD.

U.S. SATELLITES ARE GENERALLY LUCRATIVE, VULNERABLE TARGETS. OUR ABILITY TO REPLACE A SATELLITE IS CURRENTLY MEASURED IN MONTHS, OFTEN YEARS----FAR FROM TIMELY SUPPORT TO THOSE ENGAGED IN COMBAT. U.S. SPACECRAFT HAVE FUNCTIONED EXCEPTIONALLY WELL IN A THREAT-FREE ENVIRONMENT. UNFORTUNATELY, SPACE IS NO LONGER THREAT FREE.

THERE ARE FORMIDABLE THREATS TO OUR SPACECRAFT. IT IS EASY TO FALL INTO THE TRAP OF THINKING THAT SPACE IS A DISTANT, SECURE PLACE. SPACE, IN FACT, IS CLOSER THAN MIDLAND IS TO DALLAS. THE SOVIETS COULD EASILY MOUNT AN OFFENSE AGAINST OUR SPACECRAFT AND, IN FACT, THEY HAVE FOUR DIFFERENT WEAPONS TO CHOOSE FROM.

ONE WEAPON IS A CO-ORBITAL ANTISATELLITE SYSTEM THAT HAS BEEN OPERATIONAL SINCE 1972. THE SECOND WEAPON IS A DIRECT ASCENT ANTIBALLISTIC MISSILE DEFENSE SYSTEM THAT COULD BE EMPLOYED AGAINST SATELLITES. THE SOVIETS ARE TESTING LASERS THAT COULD THREATEN SATELLITES AT ALL ALTITUDES AND THEY APPEAR TO BE DEVELOPING THE CAPABILITIES TO CONDUCT ELECTRONIC WARFARE AGAINST SPACE SYSTEMS.

THE MISSION OF SPACE CONTROL DEALS WITH SUCH CAPABILITIES. SPACE CONTROL IS ANALOGOUS TO SEA CONTROL. THE U.S. NAVY DEFENDS SEA ROUTES AND SHIPS AT SEA AND HOLDS AT RISK THOSE ENEMY FORCES THAT MIGHT THREATEN US AT SEA. OUR NAVIES SAIL OFF THE COAST OF LIBYA, IN THE PERSIAN GULF, AND IN THE BLACK SEA TO ENSURE FREEDOM OF NAVIGATION. IN SPACE, THE U.S. IS "FREE TO NAVIGATE" ONLY BECAUSE THE SOVIETS ALLOW US THAT FREEDOM.

SPACE CONTROL REQUIRES WE BE ABLE TO DEFEND OUR "INFORMATION ROUTES" IN SPACE----THOSE ROUTES BETWEEN THE SATELLITE AND THE USER OF THE INFORMATION PRODUCED BY THE SATELLITE. SPACE CONTROL SHOULD PROVIDE FOR THE DEFENSE OF U.S. SATELLITES AND HOLD AT RISK THE ENEMIES "INFORMATION ROUTES."

WE HAVE NO SPACE CONTROL CAPABILITY. THE U.S. DOES NOT HAVE AN ANTISATELLITE SYSTEM AND NO SUCH SYSTEM IS CURRENTLY BEING DEVELOPED. I CANNOT DO THAT MISSION. I AM CONCERNED ABOUT OUR ABILITY TO SUPPORT OUR LAND, SEA, AND AIR FORCES AND DEFEND U.S. SPACECRAFT. BUT I WOULD BE REMISS IF I LEFT YOU WITH JUST THE NEGATIVES.

AS I HAVE ALREADY INDICATED, THE U.S. SPACE LAUNCH PROGRAM IS ON THE UPSWING. THE AIR FORCE IS BRINGING REDESIGNED AND NEW LAUNCH VEHICLES ON-LINE AND MOVING TO DEVELOP A READY, SUSTAINABLE LAUNCH CAPABILITY.

WE ARE MAKING STRIDES ALONG THE ROAD TO A U.S. ANTISATELLITE CAPABILITY. CONGRESS'S RECENT DECISION ALLOWING US TO TEST CANDIDATE ANTISATELLITE SYSTEMS MEANS WORK CAN NOW BEGIN ON DEVELOPING AN ANTISATELLITE CAPABILITY TO STRENGTHEN DETERRENCE AND GIVE THE U.S. THE TOOLS TO ENSURE THE UNOBSTRUCTED USE OF SPACE.

FINALLY, THE ROLE OF THE UNIFIED COMMANDERS IN THE PLANNING AND BUDGETING PROCESS HAS BEEN INCREASED. SPACE IS FINALLY MOVING FROM THE ALMOST EXCLUSIVE REALM OF SCIENTISTS AND ENGINEERS TO AN ARENA WHERE OPERATIONAL CONSIDERATIONS ARE ADDRESSED UP-FRONT. THE IMPACT OF THIS TREND CANNOT BE OVERSTATED.

LET ME CONCLUDE WITH AN EXAMPLE OF HOW OPERATIONAL CONSIDERATIONS MIGHT ALTER FUTURE SPACE SYSTEMS.

MILITARY COMMANDERS----NOT THE RESEARCH AND DEVELOPMENT COMMUNITY----ARE IN THE PROCESS OF FORMULATING REQUIREMENTS AND CONCEPTS OF OPERATION FOR A SPACE-BASED RADAR SYSTEM.

THIS SYSTEM WILL PROVIDE NEAR REAL TIME, ALL WEATHER, DAY AND NIGHT COVERAGE OF THE GLOBE. AS SUCH, IT WILL BE EXTREMELY DIFFICULT FOR AN AGGRESSOR TO HIDE----EVASIVE TACTICS WILL NOT BE SUFFICIENT CONCEALMENT. COMMANDERS WILL BE ABLE TO TRACK TARGETS FROM THE POINT OF ORIGIN INCREASING THE LIKELIHOOD OF KNOWING THE TARGET'S INTENTION. THIS SYSTEM WILL DETECT AND TRACK FIGHTER-SIZED AIRCRAFT AND DETECT AND TYPE SHIPS AT SEA. THESE CAPABILITIES WILL HAVE INCREDIBLE IMPACTS ON MILITARY OPERATIONS. IT MUST BE DEVELOPED WITH AN OPERATIONAL FOCUS.

AN OPERATIONAL FOCUS MEANS THAT THE SYSTEM WILL BE RESPONSIVE TO THE WARTIME DEMANDS OF OUR FIELD COMMANDERS. THE SYSTEM SHOULD PROVIDE INFORMATION DIRECTLY TO THE FORCES AT SEA, IN THE FIELD, OR IN THE AIR, THEREBY ELIMINATING DELAYS INHERENT WHEN GROUND STATIONS PROCESS AND RELAY INFORMATION.

THE SYSTEM SHOULD BE AGILE ENOUGH TO SUPPORT TACTICAL AND STRATEGIC REQUIREMENTS AROUND THE WORLD. TODAY U.S. SPACE SYSTEMS HAVE A STRATEGIC

FOCUS, BUT AS A RESULT OF SHIFTING EMPHASIS IN THE WORLD, FUTURE SYSTEMS MUST SUPPORT CONTROLLED, DISCRIMINATE RESPONSE TO AGGRESSION ANYWHERE IN THE WORLD.

THERE ARE MANY CHANGES THAT MUST BE MADE TO EFFECTIVELY USE SPACE TO SUPPORT MILITARY FORCES ON THE LAND, SEA, AND AIR. AS WITH DRILLING FOR OIL, WE HAVE TO USE THE RIGHT TOOLS. THAT'S SOMETHING ANY SUCCESSFUL ENTERPRISE MUST DO----THE MILITARY CANNOT BE AN EXCEPTION.

LET ME CONCLUDE WITH TWO THOUGHTS. FIRST, YOU CAN BE ASSURED THAT USSPACECOM IS WORKING HARD TO ENSURE MILITARY SPACE OPERATIONS SUPPORT THE MEN AND WOMEN WHO SERVE OUR COUNTRY. SECOND, AND MORE IMPORTANTLY, YOU ARE THE KEY TO SECURING THE SUPPORT NECESSARY FROM CONGRESS. YOU SET THE PRIORITIES. THIS WONDERFUL COUNTRY, WITH ITS ONE-MAN, ONE-VOTE DEMOCRACY, ENSURES THAT.

GOD BLESS EACH OF YOU FOR THE ROLE YOU PLAY IN KEEPING THIS COUNTRY FREE.

GENERAL JOHN L. PIOTROWSKI, USAF
ROTARY CLUB
MOBRIDGE, SOUTH DAKOTA
12 SEPTEMBER 1988

GOOD TO BE HERE . . . .

CHURCHILL . . . .

LET ME TALK ABOUT HOW THINGS ARE GOING IN SPACE. WE ARE ENORMOUSLY PROUD OF THE INDUSTRY THAT PROVIDES OUR SPACE SUPPORT SYSTEMS AND SATELLITES. WE'VE GONE THROUGH A HIATUS IN THE ABILITY TO LAUNCH SATELLITES, A RESULT OF THE CHALLENGER TRAGEDY. WHEN THE CHALLENGER WAS LOST, WE LOST OUR PRIMARY WAY OF PLACING SPACECRAFT IN ORBIT.

AS YOU KNOW, WE DEPEND ON SPACE FOR LOTS OF THINGS----FOR COMMUNICATIONS, FOR SURVEILLANCE, FOR THE WEATHER INFORMATION THAT YOU SEE ON YOUR TELEVISION AND YOUR NEWS REPORTS----ALL OF THAT COMES FROM SPACE----NAVIGATION FOR OUR SUBMARINES, NAVIGATION FOR OUR AIRCRAFT AND EVEN FOR SOLDIERS, WHO CAN NOW PINPOINT THEIR LOCATION FROM SPACE WITHIN ABOUT 50 FEET OF THEIR ACTUAL POSITION ANYWHERE IN THE WORLD. IT'S VERY USEFUL IN COMBAT SITUATIONS TO KNOW PRECISELY WHERE YOU ARE, KNOW PRECISELY WHERE THE ENEMY IS, AND BE ABLE TO CALL FOR ARTILLERY OR AIR

STRIKES ON ENEMY POSITIONS. IT INCREASES OUR ABILITY TO SAVE LIVES AND WIN BATTLES WHEN CALLED TO FIGHT. BUT WE'VE HAD A LIMITED CAPABILITY TO GET THINGS INTO SPACE, IN ORDER TO REPLACE THE ONES THAT WEAR OUT.

BUT THANKS TO THE KIND OF RELIABILITY, REDUNDANCY, AND QUALITY THAT HAS BEEN BUILT INTO OUR SATELLITES, THEY'VE SURVIVED. WE'VE BEEN ABLE TO CONTINUE TO DO OUR JOB AND I THINK THAT IS A SOURCE OF NATIONAL PRIDE EVEN THOUGH YOU DON'T HEAR ABOUT IT EVERY DAY.

THERE IS A CONCERN, OF COURSE, THAT IF WE EVER GET INTO A CONFRONTATION WITH THE SOVIETS, WE LACK THE ABILITY TO DEFEND OUR SATELLITES. THE SOVIETS HAVE THE CAPABILITY TO DAMAGE OUR SATELLITES AND HAVE DEVELOPED AT LEAST THREE WEAPONS THAT I'M AWARE OF----WHICH I WILL REFER TO AS THEIR ANTISATELLITE WEAPON SYSTEM. THE FIRST IS A KILLER SATELLITE----THEY LAUNCH IT, IT FLIES FORMATION WITH OUR SATELLITES, GETS CLOSE TO THEM, AND THEN FIRES SHRAPNEL AND KNOCKS THEM OUT. THE OTHER TWO WEAPONS ARE A MISSILE THAT THEY CAN SHOOT DIRECTLY AT OUR SPACE SYSTEMS AND AN R & D LASER THAT THEY CAN USE TO DESTROY OR DEGRADE OUR SATELLITE COMPONENTS. WELL, THEY HAVE THE ABILITY TO ATTACK OUR SATELLITES AND THE UNITED STATES HAS NO SIMILAR WEAPON TO ATTACK THEIRS.

I THINK THAT SITUATION IS UNTENABLE, AND I'LL EXPLAIN WHY.

LET'S SAY THAT WE WERE IN A CONFRONTATION WITH THE SOVIETS AND A SOVIET RECONNAISSANCE AIRCRAFT APPROACHED ONE OF OUR SHIPS, SAY A CARRIER WITH ABOUT 5,000 AMERICANS ON BOARD. THE NAVY WOULD CERTAINLY WANT TO SHOOT THAT DOWN AND I'M SURE THEY WOULD----SO THAT IT COULDN'T DIVULGE THE LOCATION OF THE CARRIER AND SUPPORT SHIPS. ON THE OTHER HAND, WE KNOW THAT THE SOVIETS HAVE A RADAR OCEAN RECONNAISSANCE SATELLITE----A SATELLITE THAT LOCATES SHIPS ANYWHERE IN THE GLOBE AND KEEPS THEIR LOCATIONS FIXED AT ALL TIMES. AND ALLOWS TARGETING ALL OF OUR SHIPS WITHOUT EVER APPROACHING THEM WITH AIRCRAFT OR ANOTHER SHIP. THEY WOULD ATTACK THOSE SHIPS WITH A LONG-RANGE, HIGH-SPEED CRUISE MISSILE----SOMETHING THAT TRAVELS THREE TIMES THE SPEED OF SOUND AND GOES ABOUT 300 MILES. MUCH MORE CAPABLE THAN THE SILKWORM MISSILES THAT WE WORRY ABOUT IN THE PERSIAN GULF TODAY. YET UNTIL RECENTLY, THE CONGRESS HAS PROHIBITED US FROM DEVELOPING A WEAPON THAT COULD KNOCK DOWN THIS SATELLITE.

THE SOVIETS HAVE ANOTHER ADVANTAGE IN SPACE THAT IS, IRONICALLY, A RESULT OF A SOVIET TECHNOLOGICAL INFERIORITY ---- AND IT'S WORRISOME. BACK WHEN WE STARTED GOING INTO SPACE WE WERE LAUNCHING ABOUT 60 TO 70 SATELLITES A YEAR, GROWING THROUGH THE MID-SIXTIES. THEN TECHNOLOGY ALLOWED US TO BUILD THE KIND OF LONG-LIVED, HIGHLY REDUNDANT SATELLITES THAT WE HAVE TODAY. AND WE REDUCED THE NUMBER OF LAUNCHES DOWN TO ABOUT 15 A YEAR, BECAUSE OUR SATELLITES LASTED LONGER, DID THE JOB WE EXPECTED THEM TO DO, AND WE DIDN'T HAVE TO REPLACE THEM VERY OFTEN.

THE SOVIETS, ON THE OTHER HAND, LACKED THE TECHNOLOGY TO BUILD LONG-LIVED SATELLITES. SO THEY BUILT A HUGE LAUNCH INFRASTRUCTURE AND TODAY THEY LAUNCH ABOUT 100 SATELLITES A YEAR. LAST YEAR, THEY LAUNCHED 97----WE LAUNCHED 9. THEY HAVE A SPACE FORCE THAT HAS GROWN IN THE LAST FIVE YEARS BY APPROXIMATELY 75 PERCENT. THEY HAVE DEMONSTRATED THE ABILITY WITH THIS HUGE INFRASTRUCTURE TO LAUNCH A LARGE NUMBER OF SATELLITES VERY QUICKLY. DURING THE FALKLANDS WAR, THEY TOOK A GREAT INTEREST IN WHAT WAS GOING ON OFF THE COAST OF ARGENTINA AND LAUNCHED 28 SATELLITES IN A 69-DAY PERIOD. THAT IS MORE

SATELLITES THAN WE'VE LAUNCHED IN THE LAST THREE YEARS. WHAT THAT TELLS ME IS THAT THEY HAVE A VERY LARGE SPACE INDUSTRY PRODUCING VERY RELIABLE HARDWARE WHICH ALLOWS THEM TO LAUNCH WHENEVER THEY WANT.

THIS LAUNCH CAPABILITY COUPLED WITH THEIR ABILITY TO KNOCK OUR SATELLITES DOWN AND THE CAPABILITY TO LAUNCH A LARGE NUMBER OF SATELLITES VERY RAPIDLY MEANS THEY CAN INCREASE THEIR SPACE FORCE IN A TIME OF CRISIS----WHILE REDUCING THE U.S. SPACE FORCES. THEIR VIEW OF THE BATTLEFIELD, THEIR ABILITY TO COMMUNICATE, THEIR ABILITY TO ALLOW THEIR FORCES TO NAVIGATE WOULD BE FAR SUPERIOR TO OURS. AND THAT WOULD HAVE SERIOUS CONSEQUENCES ON OUR ABILITY TO SAVE LIVES AND WIN A WAR ON EARTH.

NOW HOW CAN WE MAKE THAT BETTER? I THINK ONE WAY IS TO BE ABLE TO DESTROY INCOMING MISSILES AND THAT IS, OF COURSE, THE PROGRAM THAT THE PRESIDENT HAS NAMED THE STRATEGIC DEFENSE INITIATIVE. IT'S THE DESIRE TO BUILD A BALLISTIC MISSILE DEFENSE SYSTEM. THE FUTURE OF AMERICA, THE FUTURE OF THIS GREAT LAND OF OURS IS CURRENTLY IN THE HANDS OF THE SOVIETS----BECAUSE THEY CAN DESTROY IT. WOULDN'T IT BE FAR BETTER IF WE TOOK OUR OWN FUTURE INTO OUR OWN HANDS AND WERE ABLE TO DEFEND NORTH AMERICA?

THERE ARE FOUR REASONS PEOPLE GIVE WHY WE SHOULDN'T TRY TO BUILD A DEFENSIVE SYSTEM. IT WON'T WORK, IT COSTS TOO MUCH, IT WOULD INVITE THE SOVIETS TO ATTACK, AND IT'S NOT LEAKPROOF. LET ME TALK ABOUT EACH OF THOSE BRIEFLY.

IT WON'T WORK. THERE IS A GROUP OF SCIENTISTS THAT HAVE MET RECENTLY AND HAVE PUBLISHED A REPORT THAT SAID . . . SDI NEEDS MORE WORK. THERE IS ANOTHER GROUP OF SCIENTISTS THAT HAVE MET RECENTLY AND SAID WE SHOULD BE READY TO FIELD THE SYSTEM IN A SHORT PERIOD OF TIME. WE JUST NEED A LITTLE MORE DEVELOPMENT AND WE'RE READY TO GO.

COSTS TOO MUCH. LET ME REMIND YOU THAT IN THE DECADE OF THE 60s, GALVANIZED BY THEN PRESIDENT KENNEDY, THIS NATION PUT A MAN ON THE MOON. IN FACT, PUT SEVERAL MEN ON THE MOON. AND THAT COST 20 TO 30 BILLION DOLLARS. NOW 20 TO 30 BILLION IN 1960 DOLLARS IS ABOUT 150 TO 200 BILLION IN 1995 DOLLARS----WHICH IS WELL IN THE BALL PARK FOR A MODEST BALLISTIC MISSILE DEFENSE SYSTEM. AT THE SAME TIME THAT WE WENT TO THE MOON, WE HAD 500,000 TROOPS ON THE GROUND IN VIETNAM----FIRING AND EXPENDING AMMUNITION AT RATHER HIGH RATES. SO IF THIS NATION COULD HAVE 500,000 TROOPS ENGAGED IN COMBAT, AND PUT SEVERAL MEN ON THE MOON IN THE SAME TIME FRAME, WE COULD CERTAINLY AFFORD TO DEFEND AMERICA.

NOW THAT MOST DEMAGOGIC OF ALL ARGUMENTS----THAT IT WOULD INVITE THE SOVIETS TO ATTACK----IS JUST PURE FOOLISHNESS. THE SOVIETS HAVE NEVER SHOWN THAT THEY'RE IRRATIONAL WHEN IT COMES TO THEIR OWN SURVIVAL. THE SOVIETS WOULD NOT ATTACK NORTH AMERICA IN AN IRRATIONAL ATTACK AND INVITE THEIR OWN DESTRUCTION----AND CERTAINLY THAT IS WHAT IT WOULD MEAN. AND WHY SHOULD THEY ATTACK US FOR DOING WHAT THEY HAVE ALREADY DONE, AND THAT IS BUILD A DEFENSE SYSTEM TO DEFEND THEIR COUNTRY AGAINST BALLISTIC MISSILES?

LASTLY----THAT IT IS NOT LEAKPROOF----IS ANOTHER SPECIOUS ARGUMENT. THERE HAS NEVER BEEN ANYTHING THAT IS PERFECT----NEVER THAT I AM AWARE OF----THAT HAS BEEN BUILT BY MAN. DOES IT HAVE TO BE LEAKPROOF? WELL, I SUGGEST TO YOU NOT. THE REASON IS THAT THE PURPOSE OF A BALLISTIC MISSILE DEFENSE SYSTEM, OF COURSE, IS TO DESTROY INCOMING WARHEADS. BUT IN STRATEGY, NOT ALL WARHEADS ARE EQUAL----IT IS THE INITIAL WARHEADS THAT THE SOVIETS HAVE TO COUNT ON. IT'S THE ONES THAT WOULD ATTACK WASHINGTON; OR OMAHA, NEBRASKA; OR OUR SUBMARINE BASES; OR OUR BOMBER BASES AND MISSILE FIELDS TO PREVENT THOSE SYSTEMS FROM RETALIATING. IF THOSE CAN'T GET THROUGH AND THOSE SYSTEMS SURVIVE, THEN THE SOVIETS KNOW THAT THEY WOULD BE DESTROYED. ADDITIONALLY, THE FACT THAT SUCH A SYSTEM COULD STOP A MISTAKEN LAUNCH

OR THE PURPOSEFUL LAUNCH FROM AN IRRATIONAL COUNTRY, MAKES IT ALL A LITTLE WORTHWHILE. SO I SUGGEST TO YOU THAT IT WILL WORK, IT IS AFFORDABLE, IT WON'T INVITE THE SOVIETS TO ATTACK. THE FACT THAT IT IS NOT LEAKPROOF IS IRRELEVANT.

JOHN F. KENNEDY . . . .

GENERAL JOHN L. PIOTROWSKI, USAF
ILLINOIS LEAGUE OF SAVINGS INSTITUTIONS
COLORADO SPRINGS, COLORADO
19 SEPTEMBER 1988

THIS MORNING I'D LIKE TO DRAW YOUR ATTENTION TO SPACE AND THE IMPORTANCE IT PLAYS IN OUR QUALITY OF LIFE----IN THE BUSINESS OF RUNNING OUR BUSINESSES----IN OUR NATIONAL SECURITY----KEEPING THIS NATION AND HER PEOPLE FREE AND AT PEACE!

WITHOUT THE ABILITY TO USE SPACE AND EMPLOY SPACE-BASED SYSTEMS, THIS COUNTRY WOULD ABSOLUTELY GRIND TO A HALT. THERE WOULDN'T BE ANY TELEVISION, YOU'D HAVE TO GET THE WALL STREET JOURNAL AND USA TODAY BY MAIL, AND BY THE TIME THE NEWS REACHED US----IT WOULDN'T INTERESTING----IT WOULD BE HISTORY!

WITHOUT SATELLITES THERE COULDN'T BE ANY SUCH THING AS "INTERNATIONAL" OR "MULTINATIONAL" CORPORATIONS, SINCE ABOUT 70 PERCENT OF TRANSOCEANIC TELEPHONE TRAFFIC----BUSINESS TRAFFIC----IS HANDLED BY SATELLITES. NOT ONLY WOULD OUR QUALITY OF LIFE DECLINE, BUT OUR ECONOMIC VITALITY WOULD RAPIDLY ERODE.

TODAY MORE THAN 2,100 COMPANIES THROUGHOUT THE WORLD ARE DIRECTLY INVOLVED IN COMMERCIAL SPACE ACTIVITIES. IN THE NEXT DECADE, COMMERCIAL SPACE ACTIVITIES ARE EXPECTED TO COMPRISE A 50 BILLION DOLLAR ENTERPRISE. "COMMERCIAL SPACE" MAGAZINE REPORTS, THAT AS MANY AS 200 CIVILIAN COMMERCIAL SATELLITES WILL BE LAUNCHED WITHIN THE NEXT FIFTEEN YEARS, AT AN ESTIMATED COST OF AROUND 20 BILLION DOLLARS.

NOT ONLY IS SPACE IMPORTANT TO OUR LIVES AND TO THE QUALITY OF OUR LIVES, IT IS ABSOLUTELY VITAL TO OUR SECURITY AS A NATION AND TO OUR POSITION AS THE LEADER OF THE FREE WORLD.

U.S. MILITARY FORCES RELY ON SPACE-BASED SYSTEMS FOR SURVEILLANCE, FOR COMMUNICATIONS, AND FOR NAVIGATION. SPACE-BASED SURVEILLANCE SYSTEMS PROVIDE STRATEGIC AND TACTICAL WARNING OF WHAT POTENTIAL ADVERSARIES MIGHT BE UP TO. THEY ALSO PROVIDE US WEATHER, INFORMATION ON SEA STATES, AND NUMEROUS OTHER KINDS OF ENVIRONMENTAL OBSERVATIONS.

COMMUNICATIONS SYSTEMS ALLOW OUR NATIONAL COMMAND AUTHORITIES TO SPEAK TO THE COMMANDERS IN CHIEF----OR CINCS AS THEY'RE REFERRED TO IN MILITARY JARGON----OF OUR MILITARY FORCES WORLDWIDE.

NAVIGATION SATELLITES ALLOW LAND, SEA, AND AIR FORCES TO NAVIGATE WITH GREAT ACCURACY ANYWHERE IN THE WORLD. IT IS ALSO SPACE-BASED SYSTEMS THAT VERIFY COMPLIANCE----OR IN SOME CASES NONCOMPLIANCE----WITH TREATIES.

MY SECOND POINT IS THAT THE BALANCE IN SPACE MAY HAVE SHIFTED. LET ME GIVE YOU SOME SPECIFICS.

THE SOVIETS PRODUCE FOUR TIMES AS MANY SCIENTISTS AND ENGINEERS AS OUR COUNTRY PRODUCES, WITH OVER 12 MILLION EMPLOYED IN THE SOVIET ECONOMY. THE UNITED STATES HAS LESS THAN 2 MILLION. THE SOVIETS HAVE AROUND 900 THOUSAND SCIENTISTS AND ENGINEERS INVOLVED IN RESEARCH AND DEVELOPMENT, WITH OVER 450 THOUSAND INVOLVED IN STRICTLY MILITARY RESEARCH AND DEVELOPMENT. U.S. INDUSTRIES EMPLOY ABOUT A THIRD OF THAT NUMBER IN RESEARCH AND DEVELOPMENT.

THE SOVIETS ANNUALLY CONDUCT FIVE TO TEN TIMES AS MANY SPACE LAUNCHES AS DOES THE UNITED STATES. FOR EXAMPLE, THEY HAVE TWICE AS MANY OPERATIONAL LAUNCH PADS. THEY ANNUALLY LIFT TEN TIMES THE WEIGHT TO ORBIT THAT OUR COUNTRY IS CAPABLE OF LIFTING. THEY HAVE A THREE TO ONE AND GROWING ADVANTAGE IN MANNED SPACE FLIGHT ACTIVITIES.

NOT ONLY ARE THE SOVIETS ABLE TO GET TO SPACE AND OPERATE THERE AT WILL, THEY'RE ALSO ABLE TO DENY----I REPEAT DENY----THE USE OF LOW EARTH ORBIT SPACE TO OTHER NATIONS. THE SOVIETS HAVE HAD AN OPERATIONAL ANTISATELLITE WEAPON----OR SATELLITE INTERCEPTOR----SINCE 1971. IN ADDITION TO THEIR CO-ORBITAL SATELLITE INTERCEPTOR, THEY ALSO HAVE DIRECT ASCENT MISSILES THAT CAN BE USED IN THE ANTISATELLITE ROLE, AND KNOCK A SATELLITE OUT OF SPACE, WITH LESS THAN FOUR MINUTES WARNING FROM LAUNCH TO IMPACT. THEY HAVE LASERS THAT ARE CAPABLE OF DAMAGING LOW-EARTH ORBITING SATELLITES, AND THEY HAVE DOZENS OF LARGE FIXED AND MOBILE ANTENNAS THAT CAN BE USED FOR ELECTRONIC WARFARE OR JAMMING OF OUR SATELLITES.

CLEARLY, THE SOVIETS HAVE INVESTED HEAVILY AND HAVE ESTABLISHED A WELL-BALANCED SPACE FORCE STRUCTURE. SOVIET MILITARY EXPENDITURES FOR STRATEGIC FORCES HAVE REMAINED CONSISTENTLY BALANCED BETWEEN INVESTMENT IN BOTH OFFENSIVE SYSTEMS AND DEFENSIVE SYSTEMS. TOGETHER THEY ACCOUNT FOR ABOUT 20 PERCENT OF TOTAL SOVIET MILITARY SPENDING. IN CONTRAST, SINCE 1976, OUR COUNTRY HAS SPENT ONLY 20 CENTS OF EACH DEFENSE DOLLAR FOR STRATEGIC DEFENSE, AND 80 CENTS OF EACH DEFENSE DOLLAR FOR STRATEGIC OFFENSIVE SYSTEMS.

HOWEVER, EXCLUSIVE RELIANCE ON OFFENSIVE FORCES TO DETER IS NO LONGER REALISTIC TODAY BECAUSE IT IGNORES THE ENORMOUS CONTRIBUTION DEFENSIVE SYSTEMS GIVE TO DETERRENCE----AND THEIR ABILITY TO PROTECT OUR SOCIETY AGAINST ACCIDENTAL LAUNCHES, LUNATICS, AND A DETERMINED ATTACK. THAT'S WHY I FIND STRATEGIC DEFENSES ESPECIALLY APPEALING. STRATEGIC DEFENSES----AND I'M TALKING ABOUT THE STRATEGIC DEFENSE INITIATIVE----ARE DESIGNED TO DISABLE ANY BALLISTIC MISSILE ATTACK AFTER THE ATTACK IS LAUNCHED. THEY DON'T THREATEN ANYONE OR ANYTHING EXCEPT AN ENEMY'S BALLISTIC MISSILES LAUNCHED BY MISTAKE OR IN ANGER. BECAUSE THE ADVERSARY KNOWS THAT THERE IS NO WAY AN ATTACK WOULD SUCCEED, HE IS DETERRED FROM ATTACKING.

STRATEGIC DEFENSES ALSO PROTECT THE FORCES THAT ARE PLANNED TO BE USED IN RETALIATION. ACTIVE DEFENSES MAKE WHAT OFFENSIVE FORCES YOU HAVE STRONGER. THAT MEANS THAT AN AGGRESSOR LOSES TWICE: HE LOSES WHEN A LARGE PART OF HIS ATTACKING FORCE IS DESTROYED BY THE DEFENSE, AND HE LOSES AGAIN WHEN RETALIATION HITS HIM.

TODAY WE HAVE A FAMILY OF TECHNOLOGIES THAT COULD BE APPLIED TO DEFEND OURSELVES AGAINST BALLISTIC ATTACK. WHAT WE LACK IS A NATIONAL COMMITMENT THAT WE OUGHT TO DO THAT. ALTHOUGH PUBLIC OPINION POLLS

SHOW THAT WELL OVER TWO THIRDS OF THE CITIZENS OF THE UNITED STATES BELIEVE THAT WE OUGHT TO ACQUIRE THE MEANS TO DEFEND OURSELVES AGAINST ATTACKING BALLISTIC MISSILES, IT'S NOT CLEAR TO ME THAT TWO THIRDS OF OUR ELECTED REPRESENTATIVES HAVE BEEN CONVINCED THAT IS THE WAY TO GO.

I'M NOT SAYING THAT STRATEGIC DEFENSES ARE A PANACEA THAT WILL SOLVE ALL OUR PROBLEMS; THEY ARE NOT. WE STILL HAVE TO ACQUIRE THE MEANS TO PROTECT OUR SATELLITES, TO REPLACE THEM SHOULD THEY BE LOST IN A CONFLICT. WE STILL NEED TO BUILD UP OUR AIR DEFENSE FIGHTER FORCES. WE STILL NEED TO KEEP OUR TECHNOLOGICAL SUPERIORITY. AND WE NEED TO KEEP SOME AS YET UNDETERMINED LEVEL OF MODERN STRATEGIC OFFENSIVE FORCES. WHAT WE CANNOT DO, AND SHOULD NOT DO, HOWEVER, IS TO DO NOTHING WITH REGARD TO THE DEFENSE AND FUTURE SECURITY OF OUR GREAT NATION.

NOW WHAT I'VE OUTLINED TO YOU ARE NATIONAL PROBLEMS THAT REQUIRE NATIONAL COMMITMENTS.

WE----YOU AND I----HAVE THE OPPORTUNITY TO MAKE A PROFOUND, AND A PROFOUNDLY GOOD CHANGE IN THE WAY IN WHICH THIS COUNTRY UNDERWRITES OUR CHERISHED FREEDOMS AND IDEALS----THE HARD WON PEACE WE CURRENTLY ENJOY----THE FUTURE OF OUR GREAT NATION AND HER CHILDREN.

PEACE IS NOT DIFFICULT TO OBTAIN. WHAT IS DIFFICULT, IS TO ENSURE PERSONAL AND RELIGIOUS FREEDOM, HUMAN DIGNITY, AND ACCESS TO WORLD MARKETS, WHILE AT THE SAME TIME ACHIEVING PEACEFUL COEXISTENCE WITH A COUNTERVAILING SYSTEM.

ALEKSANDER SOLZHENITSYN CREATED ONE OF THE MOST POIGNANT PHRASES OF ALL TIME WHEN HE WROTE IN HIS "GULAG ARCHIPELAGO" THAT "FREE MEN DO NOT KNOW THE VALUE OF THINGS." THE IMPLICATION WAS AND STILL IS THAT WE----YOU AND I----DO NOT KNOW THE WORTH OF FREEDOM.

SOMERSET MAUGHAM WAS MORE DIRECT WHEN HE WROTE: "IF A NATION VALUES ANYTHING MORE THAN FREEDOM, IT WILL LOSE ITS FREEDOM; AND THE IRONY OF IT IS, THAT IF IT IS COMFORT OR MONEY THAT IT VALUES MORE, IT WILL LOSE THAT, TOO."

JOHN F. KENNEDY . . . .

GENERAL JOHN L. PIOTROWSKI, USAF
NATIONAL SECURITY INDUSTRIAL ASSOCIATION
PETERSON AFB, COLORADO
23 SEPTEMBER 1988

LET ME ADD MY WARM WELCOME TO COLORADO SPRINGS AND TO PETERSON AIR FORCE BASE. I'VE HAD THE OPPORTUNITY TO SPEAK TO THREE DIFFERENT CHURCH GROUPS----METHODIST, PRESBYTERIAN, AND BAPTIST. THE MOST RECENT ONE WAS THE PRESBYTERIAN GROUP. AFTER SPEAKING TO A BAPTIST GROUP AND FINDING OUT THAT THEY EXPECTED A THREE-HOUR SPEECH AND NOT THIRTY MINUTES, I HAD A REALLY LONG SPEECH PREPARED FOR THE PRESBYTERIAN GROUP. AS WE WERE WALKING OUT, THE MINISTER SAW ME, PUT HIS ARM AROUND ME AND SAID, "SON, WE BELIEVE THAT THERE ARE NO SOULS SAVED AFTER FIVE MINUTES AND WE START LOSING CONVERTS AFTER TEN." WELL, I KNOW I'M PREACHING TO THE CHOIR----I DON'T EXPECT CONVERTS----IN FACT, IF ANYTHING I HOPE YOU'LL MAKE SOME HERE. BUT I DON'T WANT TO LOSE ANY CONVERTS, SO I'M GOING TO KEEP MY REMARKS SHORT SO YOU CAN GET ON TO THE IMPORTANT BUSINESS OF THE DAY.

IT'S BEEN A VERY PRODUCTIVE YEAR FOR US IN THE SPACE COMMAND BUSINESS, THE COMPONENTS AND THE UNIFIED AS WELL. THE OBVIOUS THING IS THAT WE HAVE MOVED FROM DOWNTOWN COLORADO SPRINGS TO PETERSON

AIR FORCE BASE. GENERAL KUTYNA AND I FLIPPED A COIN AND IT WAS HIS COIN AND HE WON. SO HE GOT THE NICE NEW BUILDING AND I'M JUST NEXT DOOR. WE'RE DELIGHTED TO SEE HIM AND THE AIR FORCE COMPONENT IN THE NEW BUILDING. I THINK IT HAS ADDED A GREAT DEAL TO THAT COMMAND'S ABILITY TO MOVE AHEAD SMARTLY IN THE SPACE BUSINESS----AND I THINK THAT FACILITATES OUR WORKING TOGETHER.

THE OTHER BIG EVENT----OF COURSE----WAS THE ARMY SPACE COMMAND FORMATION ON 7 APRIL THIS YEAR. THEY ARE NOW A FULL FLEDGED COMMAND----ALBEIT STILL SMALL. WE EXPECT TO SEE RAPID GROWTH WITH THE RESPONSIBILITIES THEY ARE PICKING UP IN THE COMMUNICATIONS BUSINESS AND OTHER AREAS IN THE FUTURE.

BUT PERHAPS THE MOST IMPORTANT THINGS THAT HAVE HAPPENED ARE THE THINGS YOU CAN'T SEE HERE----THEY ARE NOT NEW BUILDINGS OR NEW COMMANDS BUT A GREATER EMPHASIS ON MILITARY SPACE. WE HAD A WONDERFUL EXPERIENCE WITH THE CINC'S WAR GAMES THIS YEAR, WHERE SPACE WAS PLAYED FULLY----CERTAINLY MORE THAN IT HAS EVER BEEN BEFORE. WE HAD THE OPPORTUNITY TO CALL FOR AN ANTISATELLITE, WHICH WE DON'T HAVE, UNFORTUNATELY.

WE HAD THE OPPORTUNITY TO EXERCISE SOME OF THE CONCEPTS IN THE SPACE CAMPAIGN PLAN THAT I BRIEFED YOU ON LAST YEAR. LET ME GIVE YOU A LITTLE THUMBNAIL SKETCH TO UPDATE YOU ON THAT PLAN. WE HAVE SENT THE TARGET LIST TO ALL OF THE TERRESTRIAL COMMANDS. THEY HAVE GIVEN US STRONG SUPPORT IN THE TARGETING OF THOSE TERRESTRIAL ELEMENTS THAT SUPPORT POTENTIAL ADVERSARIES' SPACE PROGRAMS. THE THING THAT IS IMMEDIATELY APPARENT IS THAT LACKING AN ANTISATELLITE SYSTEM, ANY SPACE CAMPAIGN PLAN IS A DESPERATE PLAN. IT WOULD REQUIRE ENORMOUS COURAGE ON THE PART OF THE LEADERSHIP TO IMPLEMENT BECAUSE IT REPRESENTS IN A SENSE AN ESCALATION. WE'VE GOT TO HAVE A PLAN----WE HAVE A PLAN----AND WHAT IT HAS BROUGHT TO LIGHT TO EVERYONE IN THE MILITARY LEADERSHIP IS THAT THIS NATION NEEDS AN ANTISATELLITE CAPABILITY.

ONE OF OUR PRIMARY GOALS THIS YEAR WAS TO DEVELOP SUPPORT WITHIN THE CONGRESS FOR AN ANTISATELLITE CAPABILITY----A KINETIC ENERGY ANTISATELLITE CAPABILITY. I KNOW THAT MANY OF YOU IN THIS ROOM WORKED HARD IN THE CONGRESS AND ON THE HILL TO DEFEAT THE MORATORIUM ON A TEST BAND AGAINST AN ANTISATELLITE.

WE WERE SUCCESSFUL IN DOING THAT. NOW WHAT WE REALLY NEED TO DO IS TO COME FORWARD WITH A JOINT ANTISATELLITE PROGRAM. THERE HAS BEEN SOME DIALOGUE IN WASHINGTON ON THAT AND WE HOPE TO HAVE A DEFENSE ACQUISITION BOARD MILESTONE ZERO ON AN ANTISATELLITE BEFORE THE END OF THIS CALENDAR YEAR.

SO I'M ENCOURAGED BY THE PLAY OF SPACE IN THE ANNUAL CINC's WAR GAMES SPONSORED BY THE CHAIRMAN OF THE JOINT CHIEFS OF STAFF. I'M ENCOURAGED BY THE FACT THAT WE'VE BEEN ABLE TO MOVE FORWARD IN THE CONGRESS. AND I HOPE TO BE ENCOURAGED BY BEING ABLE TO PULL TOGETHER A SPACE PROGRAM AND HAVING IT SUPPORTED IN THE DEPARTMENT OF DEFENSE. WE CAN ALL BE ENCOURAGED BY THE DEFENSE SCIENCE BOARD SUMMER STUDY WHICH WAS VERY SUPPORTIVE OF SPACE-BASED RADAR, VERY SUPPORTIVE OF DEVELOPING KINETIC ENERGY ANTISATELLITE, VERY SUPPORTIVE OF INCREASED FLEXIBILITY IN LAUNCH SYSTEMS AND THE REQUIREMENT FOR MORE RESPONSIVE LAUNCH.

SO I'M ENCOURAGED BY THOSE HAPPENINGS THIS YEAR WHICH ARE NOT VISIBLE HERE AT PETERSON. I'M ENCOURAGED BY THE SUCCESSFUL TITAN II LAUNCH, AND LOOK FORWARD TO THE FLIGHT OF THE SHUTTLE LATER THIS

MONTH----IN FACT IN JUST TWO DAYS. AS WELL AS THE LAUNCH OF THE FIRST DELTA II AND THE LAUNCH OF THE FIRST TITAN IV, WHICH WE EXPECT TO BE AS SUCCESSFUL AS THE TITAN II.

THE ONE THING THAT COMES TO MIND IS THAT THE UNIFIED COMMAND AS WELL AS THE COMPONENTS ARE GOAL ORIENTED. WE ESTABLISHED A NUMBER OF GOALS LAST YEAR----I THOUGHT OF BRINGING THEM DOWN AND BORING YOU WITH THEM, BUT DECIDED THAT IT WAS INCONSISTENT WITH MY PRESBYTERIAN LESSON. I WANT TO TELL YOU WE ARE MOVING FORWARD IN THE SPACE BUSINESS----IN THE MILITARY SPACE BUSINESS.

I'M ALSO ENCOURAGED THAT NOT ONLY IS THERE MORE SUPPORT FOR MILITARY SPACE, BUT ALSO THERE IS MORE SUPPORT OF THE MILITARY COOPERATING WITH OTHER SPACE PROGRAMS. I SHOULD TELL YOU AS A FINAL THOUGHT THAT FOR THOSE OF YOU WHO PARTICIPATED IN THE SERVICES' CALL FOR STUDIES ON SPACE-BASED RADAR, I WAS CERTAINLY ENCOURAGED WITH YOUR RESPONSES TO THAT STUDY. THE RESULTS WERE SO ENCOURAGING THAT I WENT TO SECRETARY TAFT AND SUGGESTED THAT WE NEEDED TO MOVE SMARTLY IN BUILDING THAT SYSTEM. HE SAID THAT IF WE HAD THE MONEY, WE'D DO IT RIGHT NOW. I ASKED HIM IF HE MINDED IF I WENT OUT AND CAMPAIGNED FOR MONEY----I FIGURED THAT IF JERRY LEWIS CAN WORK FOR MUSCULAR DYSTROPHY, I SHOULD BE ABLE TO WORK FOR SPACE-BASED RADAR.

WELL, RESPONSE FROM OUR ALLIES ON SPACE-BASED RADAR HAS BEEN SO OVERWHELMING THAT I THINK I'VE GOTTEN TOO FAR OUT IN FRONT. THAT'S NOT ALL BAD. THERE IS A PUSH FROM OUR FRIENDS FROM BRITAIN, OUR FRIENDS FROM CANADA, AUSTRALIA, AND OTHER NATIONS WHO CAN'T UNDERSTAND WHY WE HAVEN'T DONE IT ALREADY AND WHY WE'RE NOT MOVING FORWARD MORE SWIFTLY. THEY WANT TO HELP. I THINK THAT KIND OF PULL FROM OTHERS IS GOING TO BE VERY HELPFUL.

WE ALSO HOPE TO HAVE A MILESTONE ZERO ON A SPACE-BASED WIDE AREA SURVEILLANCE SYSTEM BEFORE THE END OF NOVEMBER. IT'S GOING TO GO FORWARD TO THE JROC ON 6 OCTOBER. SO, YOU CAN SEE, THAT PROGRAM IS MOVING ALONG REAL WELL. I CERTAINLY APPRECIATE YOUR SUPPORT IN WHAT I THINK IS AN ENORMOUSLY IMPORTANT PROGRAM; ONE THAT WILL PROVIDE GLOBAL SURVEILLANCE AND BE MORE SURVIVABLE THAN ANYTHING WE'VE GOT IN THE TERRESTRIAL OR AIRBORNE ARENA. ONE THAT WILL BE THERE TO FIGHT THE WARS THAT WE'RE LIKELY TO FIGHT AND GIVE THE WARFIGHTER IMMEDIATE, INSTANTANEOUS SURVEILLANCE ANYWHERE IN THE WORLD.

LET ME CLOSE BY SAYING I'M LOOKING FORWARD TO HAVING LUNCH WITH MANY OF YOU AND THE GALA EVENING TONIGHT WHEN YOUR SELECTION OF THE HARTINGER AWARD WILL BE ANNOUNCED. I KNOW YOU WILL BE PLEASED AT THE SELECTION; I CERTAINLY AM.

IT'S BEEN A GREAT YEAR AND WE'LL LOOK FORWARD TO AN EVEN BETTER ONE NEXT YEAR. I WANT TO THANK YOU FOR OUR COMMON GOAL AND ALL THE WORK THAT YOU DO TO SUPPORT IT----THAT IS, NATIONAL SECURITY. ESPECIALLY NATIONAL SECURITY INVOLVING OUR EFFORTS IN SPACE. I'M REMINDED OF THE FAMOUS ZSA ZSA GABOR SAYING TO EACH OF HER SEVERAL HUSBANDS----"I WON'T KEEP YOU LONG." I HAVEN'T, I WON'T ANY FURTHER. GOOD LUCK.

GENERAL JOHN L. PIOTROWSKI, USAF
"DEFENSE JOURNALISM: TOWARD AN INFORMED PUBLIC"
CENTER FOR DEFENSE JOURNALISM
WASHINGTON, DC
27 SEPTEMBER 1988

DEAN MAITRE, DISTINGUISHED GUESTS, JOURNALISTS, AIRCREW MEMBERS, FELLOW AMERICANS, AND I BELIEVE I CAN SAY SINCERELY----PATRIOTS ALL. I REALLY APPRECIATE BEING HERE WITH YOU AND I'M DELIGHTED I'M NOT PART OF THE B-1 DISCUSSION, BUT I HAVE SOME THINGS TO SAY ABOUT THE B-1 AND I'LL WEAVE THEM IN.

YOU KNOW, IT'S GREAT TO BREAK BREAD IN A COMMON CAUSE. AND THE COMMON CAUSE IS REALLY THE SECURITY OF THIS GREAT NATION OF OURS. A THOUGHT OCCURRED TO ME AS I WAS COMING UP THE ELEVATOR. I HAD A BLAZING GLIMPSE OF THE OBVIOUS AND I'M SURE ALL OF YOU HAD IT AND THAT IS ONE REASON WE'RE HERE. I CAN'T THINK OF TWO GROUPS OF PEOPLE----THE MILITARY AND THE MEDIA----THAT NEED EACH OTHER MORE IN A FREE SOCIETY. AFTER ALL, WHAT GUARANTEES YOUR RIGHT TO FREE SPEECH AND TO PUBLISH THE TRUTH AS YOU SEE IT? WHO UNDERWRITES THAT FREEDOM? THE MILITARY.

ON THE OTHER HAND, WHO PROVIDES THE MEANS BY WHICH WE CAN TELL OUR STORY SO THAT WE CAN DO WHAT NEEDS TO BE DONE, THAT IS, TO BUILD CONFIDENCE IN THE MILITARY----CONFIDENCE IN NATIONAL SECURITY----CONFIDENCE IN THE AMERICAN PUBLIC? YOU DO. WE NEED EACH OTHER. WE NEED TO BE STRONG, OBJECTIVE CRITICS OF OUR WORK, OF YOUR WORK, AND OF MY WORK. BECAUSE IF WE ARE, WE WILL BE ABLE TO CARRY OUT THE JOB OF UNDERWRITING YOUR RIGHT TO FREE SPEECH. YOUR EFFORTS IN INFORMING THE AMERICAN PUBLIC THAT NATIONAL SECURITY AND THE MILITARY FORCES THAT PROVIDE IT ARE DOING THE RIGHT KIND OF JOB ARE CRITICAL TO OUR SUCCESS.

WITH THAT OPENING, LET ME JUST SAY I RECOGNIZE HOW DIFFICULT IT IS TO GIVE AN AFTER-DINNER SPEECH. I'M REMINDED OF THE PROBLEM FACING MALCOLM FORBES THESE DAYS. HE KNOWS WHAT IS EXPECTED OF HIM, HE JUST DOESN'T KNOW HOW TO MAKE IT INTERESTING. FOR THOSE OF YOU WHO DON'T KNOW MALCOLM FORBES, I'M REFERRING TO HIS WIFE, LIZ TAYLOR, OF COURSE.

WINSTON CHURCHILL SAID, "AFTER-LUNCHEON SPEAKING WAS ONE OF THE THREE MOST DIFFICULT THINGS TO DO IN THE WORLD. THE FIRST IS TO CLIMB A SMOOTH WALL LEANING TOWARD YOU. THE SECOND, TO KISS A BEAUTIFUL LADY LEANING AWAY." I NOTICED YOU ALL LAUGHED AT THE SECOND ONE, SO YOU OBVIOUSLY DON'T HAVE MUCH EXPERIENCE WITH THE SMOOTH WALL. HE ALSO SAID THAT

"LUNCHEON SPEAKERS SHOULD BE MUCH LIKE A SCOTMAN'S KILT. LONG ENOUGH TO COVER THE SUBJECT AND SHORT ENOUGH TO RETAIN INTEREST." SO I WILL FOLLOW THAT ADVICE BECAUSE I KNOW THAT YOU HAVE SOME IMPORTANT THINGS TO DO.

THERE ARE A NUMBER OF PEOPLE IN THIS ROOM----AND I THINK BEN SCHEMMER IS ONE OF THEM----THAT KNOW WHEN YOU ARE SELECTED TO THE POSITION OF GENERAL OFFICER, AT LEAST IN THE AIR FORCE, YOU'RE SENT TO CHARM SCHOOL. NOW THERE ARE A NUMBER OF THINGS THEY TEACH YOU AT CHARM SCHOOL. PERHAPS THE MOST IMPORTANT IS THAT PEOPLE THAT INVITE YOU TO THINGS DON'T REALLY WANT YOU TO COME. SO HAVE THE GOOD SENSE TO DECLINE. WELL, I FAILED THAT TEST HERE TODAY. THE OTHER IS THAT IF YOU HAVE THE BAD JUDGMENT TO GO, FOR GOODNESS SAKE LEAVE EARLY SO THAT OTHERS CAN HAVE A GOOD TIME. AND I WILL DO THAT TO MAKE UP FOR MY FIRST MISTAKE.

THEY ALSO TEACH YOU THAT IN SPEAKING TO A PUBLIC GROUP, ESPECIALLY A CIVILIAN AUDIENCE----OR A LARGELY CIVILIAN AUDIENCE----YOU SHOULD TRY AND INCLUDE THREE TOPICS. POINT WITH PRIDE, VIEW WITH ALARM, AND "THE RUSSIANS ARE COMING." AND I WILL TRY AND WEAVE THOSE IN BECAUSE I THINK THEY ARE IMPORTANT AND HOPEFULLY WILL MAKE ALL THREE POINTS.

TODAY, I'M GOING TO ADDRESS TWO SUBJECTS. FIRST, THE GREAT RESPONSIBILITY THAT YOU HAVE TO THE AMERICAN PEOPLE; I WOULD LIKE TO USE SOME OF MY OWN EXPERIENCES ALONG THE WAY. THE OTHER SUBJECT IS WHERE I THINK WE HAVE FALLEN DOWN IN DOING THE KIND OF OBJECTIVE JOB THAT I THINK IS NECESSARY----TO REPORT HONESTLY TO THE AMERICAN PEOPLE ABOUT THE LEVEL OF THEIR NATIONAL SECURITY. AND I WILL FOLLOW ZSA ZSA GABOR'S ADVICE TO MANY OF HER SEVERAL HUSBANDS, "I WON'T KEEP YOU LONG."

THE MILITARY HAS CHANGED DRAMATICALLY SINCE GENERAL SKANTZE AND I WERE YOUNGSTERS, PROBABLY MORE THAN ANY ELEMENT OF OUR SOCIETY. I ENTERED THE MILITARY IN 1952 WHEN IT WAS MANPOWER INTENSIVE AND TECHNOLOGY SHORT. AND THAT HAS CHANGED RATHER DRAMATICALLY----I THINK----MORE THAN IN ANY OTHER WALK OF LIFE.

WE DID EVERYTHING INTERNALLY BECAUSE IT WAS CHEAP. SALARY FOR A YOUNG ENLISTED PERSON WAS $75. AN AIRCREW LIEUTENANT WOULD BE PAID $200 PLUS 50 PERCENT FOR FLYING. SO $300 A MONTH IS WHAT WE PAID LIEUTENANTS BACK IN THE 1950s.

WE HAD LOTS OF PEOPLE TO DO KP AND LOTS OF PEOPLE TO DO JANITORIAL SERVICE. ONE OF THE WAYS TO CLEAN FLOORS IN THOSE DAYS----I KNOW, I'VE GOT PERSONAL

EXPERIENCE----WAS TO TAKE A VERY COMMON INGREDIENT, SAND, THROW IT ON THE FLOOR, ISSUE A BRICK AND RUB THE SAND WITH THE BRICK UNTIL THE FLOOR GOT CLEAN. WE DON'T DO THAT ANYMORE. OUR MILITARY PERSONNEL ARE VERY, VERY TECHNICAL AND HIGHLY SKILLED PEOPLE. OUR GREAT YOUNG MEN AND WOMEN ARE JUST ABSOLUTELY FANTASTIC. THEY MAKE MY JOB EASY. WE'RE NOW A HIGH TECH FORCE; ALONG WITH THAT HIGH TECH FORCE IS THE HIGH TOUCH THAT IS REQUIRED OF LEADERSHIP IN THE MILITARY. LEADERS TRY TO PROVIDE THE KINDS OF REWARDS THAT OUR YOUNG PEOPLE APPRECIATE.

THE AIR FORCE RECRUITS ABOUT 60,000 YOUNG MEN AND WOMEN A YEAR. THEY ARE THE BEST YOUNG MEN AND WOMEN WE'VE SEEN AND I THINK I COULD SAY THAT FOR ALL THE SERVICES. THEY'RE BRIGHTER, BETTER EDUCATED, MORE COMMITTED, MORE AWARE. THEY WANT TO DO WELL. THEY WANT TO SERVE THEIR COUNTRY. THEY BELIEVE THAT OUR CHERISHED VALUES ARE WORTH DEFENDING. YOU CAN ASK ANY ONE OF THEM. THEY BELIEVE WHAT THEY ARE DOING IS GOOD, IS RIGHT. AND THEY ARE DISAPPOINTED WHEN WHAT THEY DO, ESPECIALLY WHEN IT IS FAR FROM HOME AND AT GREAT PERSONAL SACRIFICE, IS NOT REFLECTED ACCURATELY IN THE MEDIA.

BUT MORE IMPORTANT THAN THE SELF-ESTEEM THAT COMES FROM READING IN THE MEDIA OR WATCHING ON TELEVISION, IS THE FACT THAT OUR COLLEGE GRADUATES, OUR OFFICERS REPRESENTED BY THESE AIRCREW AND OTHERS HERE TODAY, REPRESENT ONLY TWO PERCENT OF THE COLLEGE GRADUATES EACH YEAR IN THIS NATION OF OURS. TWO PERCENT, THAT MEANS THAT 98 PERCENT OF THE COLLEGE GRADUATES, 98 PERCENT OF THE PROFESSIONALS, 98 PERCENT OF THE PEOPLE IN INDUSTRY AND IN LAW, DO NOT HAVE ANY PERSONAL CONTACT WITH THE MILITARY. THEY DON'T KNOW ABOUT THE MILITARY. WHAT THEY KNOW ABOUT THE MILITARY IS WHAT THEY SEE IN CARTOONS----BEETLE BAILEY, SO ON AND SO FORTH----AND WHAT THEY READ IN THE PAPER.

WILL ROGERS REALLY GAVE US A PROPHETIC AND PROFOUND STATEMENT WHEN HE SAID, "ALL I KNOW IS WHAT I READ IN THE NEWSPAPERS." AND ALL THOSE 98 PERCENT OF THE PEOPLE KNOW IS WHAT THEY READ IN THE NEWSPAPERS. TO A LARGE DEGREE, THE PEOPLE WITHOUT COLLEGE EDUCATION OR COLLEGE DEGREES REPRESENT AN EVEN LARGER SEGMENT OF OUR SOCIETY WHO KNOW VERY LITTLE ABOUT THE MILITARY AND WHO MAY FEEL THAT THEIR TAX DOLLARS ARE PERHAPS NOT BEING USED PROPERLY.

YOU HAVE A RESPONSIBILITY TO THIS NATION TO REPORT ACCURATELY THE TRUE LEVEL OF NATIONAL SECURITY IN THIS COUNTRY . . . BECAUSE THAT IS THE ONLY WAY THE PEOPLE ARE GOING TO KNOW. IT'S INTERESTING TO ME----AND THIS IS A REFLECTION NOT ONLY ON WHAT YOU HEAR BUT WHAT YOU READ----THAT 20,000 PEOPLE A YEAR COME THROUGH MY

HEADQUARTERS IN COLORADO SPRINGS AND THINK THEY ARE VISITING "WAR GAMES." THEY ARE LOOKING FOR THE "WHOPPER COMPUTER." THEY DON'T FIND IT OF COURSE----WHAT THEY FIND ARE SOME HARD WORKING MEN AND WOMEN.

THEN WE GET TO TALKING ABOUT DEFENSE OF AMERICA; WE TALK ABOUT THE LAUNCHES THAT WE SEE IN CHEYENNE MOUNTAIN CONDUCTED ON A REGULAR BASIS BY THE SOVIETS AND BY OTHERS. THEY SAY, WELL, OF COURSE, WE HAVE A DEFENSE AGAINST THE BALLISTIC MISSILE DON'T WE? AND THEY ARE SHOCKED. NEARLY 19,500 OF THEM ARE SHOCKED THAT THIS NATION CAN'T DEFEND ITSELF. SO NOT ONLY DO THEY NOW KNOW WHAT IS IN THE MEDIA, BUT THEY DON'T EVEN KNOW ALL THE FACTS OF OUR OWN NATIONAL DEFENSE STRUCTURE.

WELL, I THINK THAT IT IS A VERY, VERY SIGNIFICANT RESPONSIBILITY THAT YOU HAVE IN EDUCATING THE PEOPLE ABOUT THE LEVEL OF THEIR NATIONAL DEFENSE AND THEIR SECURITY. WE REALLY NEED EACH OTHER. WE REALLY HAVE A COMMON CAUSE . . . FOR US TO ENSURE YOUR FREEDOM, THE RIGHT OF FREEDOM OF THE PRESS WHICH YOU BELIEVE TO BE TRUE----IN A TRULY FREE SOCIETY----AND YOUR RESPONSIBILITY TO KEEP THE SOCIETY INFORMED ON OUR ABILITY TO ENSURE THOSE FREEDOMS.

I READ SO MUCH ABOUT THE NEED TO ACHIEVE PEACE, THE NEED TO SECURE PEACE. I'M REMINDED OF WHAT ALEKSANDR SOLZHENITSYN SAID IN THE GULAG ARCHIPELAGO, PROBABLY THE MOST POIGNANT PHRASE I'VE READ IN A LONG TIME, "FREE MEN DON'T KNOW THE VALUE OF THINGS." THE IMPLICATION WAS THEN AND IS NOW, FREE MEN DON'T KNOW THE VALUE OF FREEDOM. I RECENTLY READ A METHODIST PAMPHLET CALLED IN DEFENSE OF CREATION. IN IT, I FOUND THE WORD PEACE WAS MENTIONED HUNDREDS OF TIMES, BUT I ONLY FOUND THE WORD FREEDOM TWICE. CERTAINLY, A FREE PEOPLE WILL CHERISH AND SEEK THE PEACE. WE'RE A PEACEFUL PEOPLE. WE ABSOLUTELY CHERISH OUR FREEDOM. BUT I THINK THE ISSUE THAT I WANT TO MENTION IS FREEDOM.

NOW LET ME GO BACK TO MY PERSONAL EXPERIENCES. MY FIRST INTRODUCTION TO THE MEDIA REPORTING ON NATIONAL SECURITY WAS AN INCIDENT INVOLVING A FELLOW NAMED JERRY SHANK. JERRY SHANK WAS A T-28 PILOT IN VIETNAM, KILLED IN EARLY 1964. I BELIEVE HE CAUSED HIS OWN DEATH. IT WAS A SIMPLE PILOT ERROR. AND THAT SIMPLE PILOT ERROR INVOLVED SHOOTING ROCKETS AT A SAMPAN AND THEN TRYING TO STRAFE IT BUT HE FORGOT TO CHANGE THE DEPRESSION. THAT FORCES THE BULLETS LONG SO HE TRIED TO CORRECT BY PUSHING THE NOSE OF THE

AIRCRAFT DOWN, BRINGING THE BULLETS FORWARD. THEN HE DID WHAT ANYBODY WOULD PREDICT WOULD HAPPEN----HE COULD NOT PULL OUT AND WAS KILLED WHEN HIS PLANE IMPACTED THE WATER.

WELL, JERRY SHANK BECAME RATHER FAMOUS AND INFAMOUS BECAUSE HE AND HIS WIFE WROTE PASSIONATE LETTERS BACK AND FORTH TO EACH OTHER. AFTER HE DIED, HIS WIFE RELEASED THE LETTERS OR PARTS OF THE LETTERS TO U.S. NEWS AND WORLD REPORT. THEY PUBLISHED SMALL EXCERPTS WHICH WERE THOUGHT TO REFLECT THE ATTITUDE OF THE AIR FORCE MEN AND WOMEN IN VIETNAM AT THAT TIME. HE SAID THREE THINGS THAT WERE LATER THE SUBJECT OF A SENATE INVESTIGATION----TWO OF THEM I CAN REMEMBER THE THIRD ONE I CAN'T; BUT THEY WERE ESSENTIALLY THIS. HE SAID, "THE BIRD IS GREAT, IT TAKES A BEATING." THE BIRD WAS A T-28 THAT I FLEW ON TWO TOURS IN VIETNAM. AND HE ALSO SAID, "THE BIRD IS GREAT, EVERYBODY IS FEELING GOOD." AND I READ THOSE COMMENTS AND I THOUGHT----I WOULD AGREE WITH THAT----MORALE IS GOOD, PEOPLE ARE FEELING GOOD. IT IS AN AIRCRAFT THAT IS CAPABLE OF THE TASK. WE ALSO HAD GOONEY BIRDS AND B-26s OVER THERE THAT WERE ADEQUATE FOR THE TASK AT HAND.

WELL A COUPLE OF WEEKS LATER, ANOTHER NATIONAL PUBLICATION PUBLISHED THE LETTERS IN A LONGER VERSION. AND I READ WITH INTEREST THOSE LETTERS AGAIN. ONLY

WHEN I GOT TO THE PART THAT SAID, "THE BIRD IS GREAT, IT TAKES A BEATING" IN HIS HANDWRITING IT SAID, "THE BIRD IS GREAT IF IT TAKES THE BEATING." AND IT NO LONGER SAID THE BIRD IS GREAT, MORALE IS HIGH OR THE BIRD IS GREAT, EVERYBODY'S FEELING GOOD. IT SAID, "MORALE IS GREAT, EVERYBODY'S FEELING GOOD."

NOW THE SIGNIFICANT RESULT OF THAT PUBLICATION WAS THAT SENATOR STENNIS, THEN CHAIRMAN OF THE ARMED SERVICES COMMITTEE, INVITED ME AND A COUPLE OTHERS THAT HAD BEEN TO VIETNAM AND SERVED IN THE SAME CAPACITY AS JERRY SHANK----IN FACT KNEW JERRY SHANK----TO TESTIFY TO HIS COMMITTEE. THE FIRST INDIVIDUAL TO TESTIFY SAID, "I'LL BE HAPPY TO ANSWER YOUR QUESTIONS SENATOR STENNIS, BUT WOULD YOU FIRST ANSWER ONE OF MINE?" THE SENATOR WAS OBLIGING AND THE FIRST FELLOW ASKED, "I'D LIKE TO KNOW WHAT JERRY SHANK REALLY SAID." WE ASKED THE PUBLISHERS OF THAT SECOND MAGAZINE AND THEY INDICATED THAT THE REASON IT WAS DIFFERENT IS THEY BELIEVED THAT IS WHAT JERRY SHANK WOULD HAVE SAID IF HE WERE ALIVE TODAY.

THE OTHER EXPERIENCE I HAD WAS RELATED TO THE SAME INCIDENT. HERE I AM, A YOUNG CAPTAIN HAVING JUST MADE 0-3. I WAS ABOUT TO PCS AND I HAD A LOT OF THINGS ON MY MIND LIKE GETTING MY WIFE AND KIDS OUT OF THE HOUSE AND GETTING STUFF MOVED. I WAS TESTING A WEAPON FOR THE AIR FORCE TO BE USED AS A SURVIVAL

WEAPON. I WAS OUT ON THE RIFLE RANGE AND SOMEBODY GRABBED ME AND SAID, "YOU'VE GOT TO GET ON AN AIRPLANE IN AN HOUR. YOU HAVE BEEN INVITED TO TESTIFY BEFORE THE SENATE." WELL, I SAID SOMETHING UNCOMPLIMENTARY LIKE, "I'M BUSY." BUT THIS PERSON WAS PERSISTENT AND THREATENED ME WITH BODILY HARM. SO I DID MY THING----I THREW THE WIFE AND KIDS OUT ON THE STREET, TOLD THEM TO GO AND GET ANOTHER APARTMENT AND I CAME TO WASHINGTON.

I STOPPED BY MY COMMANDER'S OFFICE BECAUSE I HAD NEVER BEEN TO CONGRESS. MY PERCEPTION WAS THAT PERHAPS I WOULD BE TOLD TO SAY SOMETHING OTHER THAN THE TRUTH. THAT IS WHAT I HAD BEEN LED TO BELIEVE BY READING THE MEDIA AND BY THE CARTOONS. SO I STOPPED BY GENERAL PRITCHARD'S OFFICE. HE SAID, "DON'T WORRY ABOUT A THING, PETE, JUST TELL THE TRUTH." I WAS SHOCKED. I NEVER EXPECTED TO BE TOLD TO TELL THE TRUTH. THAT WAS THE PERCEPTION OF THE MILITARY AT THAT TIME. NOT THAT I PLANNED TO DO ANYTHING ELSE, BUT THAT'S NOT WHAT I EXPECTED TO HEAR.

WELL, I WAS CALLED IN TO SEE A FELLOW NAMED CURT LEMAY, WHO WAS THE CHIEF OF STAFF OF THE AIR FORCE, AND HE SAID, "I JUST BROUGHT YOU BY HERE TO TELL YOU THAT THE AIR FORCE HAS NOTHING TO HIDE. ALL WE WANT YOU TO DO IS TELL THE TRUTH. BUT I'VE GOT A BIT OF ADVICE FOR YOU. BE SURE AND BOUND THE TRUTH. WHEN

YOU TELL THE TRUTH, TELL THEM----WHEN YOU WERE THERE, HOW MANY TIMES IT HAPPENED, AND AT LEAST GIVE IT SOME BOUNDING. DON'T JUST SAY YES OR NO, FILL THEM IN----DON'T LEAVE THEM WITH HALF TRUTHS."

THEN WE WERE DRAGGED INTO SECRETARY ZUCKERT'S OFFICE. SECRETARY ZUCKERT, WHO IS A RATHER COLORFUL INDIVIDUAL, HAD HIS FEET UP ON HIS DESK AND SAID, "I KNOW CURT HAS ALREADY TOLD YOU, BUT I WANT YOU TO BE SURE AND TELL THE TRUTH. THAT'S ALL THAT IS IMPORTANT." WHEN I FOUND OUT HOW THE LETTERS FROM JERRY SHANK IN HIS OWN HANDWRITING WERE CHANGED, MY IMPRESSION OF THE MEDIA WAS SOMEWHAT LET DOWN.

ON THE OTHER HAND, THE MEDIA IS A VERY POWERFUL FORCE. LET ME TELL YOU HOW THE MEDIA ENDED A WAR. I WAS IN SUDAN VISITING A LOCATION WHERE I HAD FIVE TROOPS. IT'S NOT THE END OF THE WORLD, BUT YOU CAN SEE IT FROM THERE. POOR SUDAN HAD SOMETHING LIKE THREE HUNDRED REFUGEES FROM ETHIOPIA AND CHAD. IT WAS A HELLHOLE. WE HAD THESE FIVE BRIGHT YOUNG KIDS, FIVE ENLISTED FOLKS THAT WERE DOING A MAGNIFICENT JOB. I WENT OVER TO SEE THEM ABOUT TWICE A YEAR AND WOULD HAVE DONE ANYTHING FOR THOSE KIDS.

ANYWAY, I WAS STOPPING BY TO VISIT THEM AND A SUDANESE LIEUTENANT GENERAL WHO WAS THE COMMANDER OF THAT AREA CAME UP AND SAID, "YOU MUST HURRY, GENERAL, BECAUSE YOU HAVE AN APPOINTMENT WITH THE PRESIDENT." AND I SAID, "I'M SORRY, I'VE NOT BEEN AUTHORIZED BY THE STATE DEPARTMENT TO MEET WITH YOUR PRESIDENT. I WOULD BE HONORED BUT IT'S NOT ON MY SCHEDULE." HE SAID, "YOU DON'T UNDERSTAND. YOU HAVE AN APPOINTMENT WITH THE PRESIDENT, GET BACK ON THE AIRPLANE AND FLY TO KHARTOUM." ABOUT THAT TIME ONE OF THE SERGEANTS SHOWED UP WITH A MESSAGE AND SAID THAT I WAS AUTHORIZED TO MEET WITH THE FIRST VICE PRESIDENT.

SO LIKE A GOOD SOLDIER, I GOT ON AN AIRPLANE, CHANGED FROM MY BWANA SUIT TO A RESPECTABLE THREE-PIECE BUSINESS SUIT IN THE CRAMPED QUARTERS OF A T-39. WHEN I GOT OUT OF THE AIRPLANE AT KHARTOUM, THERE WERE MERCEDES LINED UP AND TELEVISION CAMERAS CRANKING. I GOT IN THE CAR AND THE CHARGE SAID, "I KNOW YOU DON'T KNOW WHAT IS GOING ON BUT THE ETHIOPIANS HAVE JUST ATTACKED SUDAN. WHAT WE WANT TO DO IS RUN YOU BY THESE CAMERAS, TAKE YOU TO THE PALACE, HAVE YOU SHAKE HANDS WITH THE FIRST VICE PRESIDENT. ON THE NEWS TONIGHT WILL BE 'GENERAL PIOTROWSKI, COMMANDER OF CENTRAL AIR FORCE, VISITS SUDAN TO LOOK OVER THE SITUATION'."

AN ENTIRELY DIFFERENT SITUATION BUT, NEVER THE LESS, I WAS THERE TO LOOK OVER THE SITUATION. CAMERAS ROLLED AT THE PALACE, I MET THE FIRST VICE

best copy available

PRESIDENT, WE TALKED ABOUT HIS HOBBY OF BIRD WATCHING AND A FEW OTHER THINGS. HE ASKED ME HOW THINGS WERE GOING IN SUDAN. AND THAT NIGHT I WATCHED IT ON TELEVISION. MY PICTURE, THE VICE PRESIDENT SHAKING HANDS, SMILING. AND I'M SURE IN ARABIC OR WHATEVER LANGUAGE WAS APPROPRIATE, THE ANNOUNCER SAID, "GENERAL PIOTROWSKI, COMMANDER OF CENTRAL AIR FORCE, IS HERE TO LOOK OVER THE SITUATION." THE ETHIOPIANS PULLED OUT. SO WHATEVER YOU DO, YOU MUST ENSURE THAT IT IS A POWERFUL TOOL FOR TRUTH.

NOW, AS MARK TWAIN SAID, "THE ENORMOUS DIFFERENCE BETWEEN A LIE AND A CAT IS THAT THE CAT ONLY HAS NINE LIVES." LARRY SKANTZE, WHO I ADMIRE GREATLY, IS THE GUY THAT TAUGHT ME ABOUT AWACS. HE WAS THE AWACS PROGRAM MANAGER AND WE FLEW TOGETHER IN THE FIRST OPERATIONAL AWACS. THE HEADLINES AFTER THAT FLIGHT WERE "SITTING DUCK OR FLYING TURKEY?" FORTUNATELY, BOTH WERE WRONG. THE THING THAT COMES BACK TO HAUNT US ARE THOSE IRRESPONSIBLE, UNRESEARCHED ARTICLES.

I CAN REMEMBER THE ONE ABOUT THE $9,600 ALLEN WRENCH. IT WOULD HAVE BEEN CORRECT IF THE HEADLINE OR ARTICLE SAID, "AIR FORCE WAS CHARGED $9,600 FOR ALLEN WRENCH." THE TRUTH IS, WE NEVER PAID IT. WE RECOGNIZED THAT NOBODY WOULD PAY $9,600 FOR AN ALLEN WRENCH; SOME SMART SERGEANT SAID THAT'S

UNREASONABLE. IT WAS CHALLENGED. THE AIR FORCE BOUGHT THE DRAWINGS FOR THAT SPECIFIC TOOL FOR THE F-16 FOR $45 AND BUILT THEIR OWN WRENCHES FOR ABOUT SIXTEEN CENTS. NO, IT'S NOT DISHONEST TO SAY THE AIR FORCE WAS CHARGED $9,600 FOR AN ALLEN WRENCH. IT'S DISHONEST OR AT LEAST PARTIALLY DISHONEST BECAUSE NO ONE SAID, "BUT THANK GOD THEY DIDN'T PAY FOR IT."

IT'S ALSO TRUE THAT ARTICLES ABOUT THE $7,600 COFFEEPOT WERE SLIGHTLY INCORRECT. WE PAID SOMEWHERE BETWEEN $4,000 AND $7,600 FOR A COFFEEPOT. WHAT COMES TO MIND IS----OF COURSE----THAT ANYBODY CAN BUY A MR COFFEE FOR $18 MAYBE $20. THE TRUTH IS WHAT WOULD HAVE MADE THAT STORY MORE VALID IS THE AIRLINES COULD BUY IT FOR $3,600. WE SHOULD HAVE PAID $3,600. THE THING THAT WAS DISTORTED WAS THE IMPRESSION THAT A COFFEEPOT THAT IS DESIGNED TO WORK SAFELY ON AN AIRPLANE, COULD BE BOUGHT FOR $12 INSTEAD OF $7,600; THAT'S INCORRECT.

THE AIR FORCE WORKS HARD TO BE GOOD STEWARDS OF THE TAXPAYERS' DOLLARS. AND WE DESERVE TO BE HIT, AND HIT HARD, WHEN WE SCREW UP. BUT LET'S PUT THAT IN PERSPECTIVE. THE AIR FORCE BY COUNT NEGOTIATES FIVE MILLION CONTRACTS A YEAR----SOME OF THOSE ARE TOILET PAPER, SOME OF THOSE ARE MESS HALLS, SOME OF THEM ARE FOR BAGS OF POTATOES, SOME OF THOSE ARE FOR B-1s----FIVE MILLION CONTRACTS A YEAR. NOW MOST OF

YOU IN THIS ROOM ARE TOO YOUNG TO REMEMBER IVORY SOAP. IF WE WERE BETTER THAN IVORY SOAP, IF WE WERE 99.99 PERCENT RIGHT ON EVERY CONTRACT WE WROTE, WE WOULD MAKE 500 MISTAKES. THERE ARE ABOUT 425 OUT THERE WE ARE STILL LOOKING FOR. WE'RE NOT THAT GOOD. BUT BELIEVE YOU ME, OUR PEOPLE ARE TRYING.

I WANT TO TOUCH JUST BRIEFLY ON THE B-1. THIS HAS TO DO WITH THE NINE LIVES ISSUES. AND THAT IS, I'VE READ OVER AND OVER AND OVER AGAIN ABOUT HOW THE B-1 HAS GROWN 7,000 POUNDS. WHAT I NEVER READ WAS THAT IT WAS PURPOSELY INCREASED 7,000 POUNDS SO THAT IT COULD CARRY SIGNIFICANTLY MORE FUEL AND WEAPONS. I THINK IT'S INACCURATE AND BORDERS ON DISHONESTY TO SAY THAT THE B-1 IS NO GOOD BECAUSE IT IS 7,000 POUNDS HEAVIER. THERE ARE LOTS OF THINGS TO SAY ABOUT THE B-1----BUT THAT HAPPENS TO BE A BAD RAP.

THE OTHER INCIDENT THAT STRUCK ME WAS THAT IT WAS REPORTED THAT THE B-1 WOULD NOT FLY AS HIGH AS THE 747. IF THAT AIRPLANE WAS DESIGNED TO FLY AS LOW AS 200 FEET AS WELL AS HIGH AS THE 747, WE WOULD BEAT THE AIRCREWS TO DEATH. YOU NEED A DIFFERENT WING FOR THEM TO BE ABLE TO FLY FAST AT LOW ALTITUDES. SO IT'S A BUM RAP TO SAY IT WON'T FLY HIGH BECAUSE IT WAS NOT DESIGNED TO FLY HIGH. IT WAS A DISHONEST STATEMENT AND OBVIOUSLY PEJORATIVE. I GUESS PEJORATIVE LABELS BOTHER ME A LITTLE BIT. I GUESS "STAR WARS" COULD BE A

GOOD LABEL. IT TURNS OUT TO BE A BAD LABEL. I THINK STAR WARS WAS COINED TO BE A PEJORATIVE TERM. WHY NOT "FREEDOM SHIELD" OR "PEACE SHIELD?" WHY NOT SOMETHING THAT HAD MORE OF A CONNOTATION THAT DESCRIBES WHAT IT REALLY IS?

LET ME TALK JUST A MINUTE ABOUT BALLISTIC MISSILE DEFENSE. AMERICANS BELIEVE WE HAVE ONE. I BELIEVE WE SHOULD HAVE IT. THERE ARE SEVERAL ARGUMENTS THAT I OFTEN READ ABOUT BALLISTIC MISSILE DEFENSE THAT ARE VERY DEMAGOGIC. FIRST, IT WON'T WORK----I WON'T EVEN COMMENT ON THAT, I'M NOT A SCIENTIST. BUT THERE ARE A LOT OF PEOPLE THAT BELIEVE IT WILL WORK; MOST IMPORTANTLY THE SOVIETS BELIEVE IT WILL. THEY HAVE ONE AND THEY ARE IMPROVING ON IT----MAKING IT BETTER. TODAY, THEY HAVE A MILLION POUNDS OF EXCESS LAUNCH CAPACITY A YEAR AND THEY'RE GOING TO TWO MILLION POUNDS OF EXCESS LAUNCH CAPACITY AVAILABLE TO THEM. ONE HAS TO WONDER WHY A NATION THAT IS INDUSTRIALLY POOR, AGRICULTURALLY POOR, ECONOMICALLY POOR, WOULD INVEST ROUGHLY $20 TO $40 BILLION TO DEVELOP THAT EXCESS LAUNCH CAPACITY AND WHAT THEY WILL USE IT FOR. PERHAPS THEY WILL LAUNCH THEIR OWN STRATEGIC DEFENSE INITIATIVE.

THE SECOND ARGUMENT IS THAT IT COSTS TOO MUCH. I SEE LOTS OF COMPARISONS AND THERE ARE SOME COMPARISONS OF WHAT WE CAN DO IN AMERICA FOR $150 BILLION OR $200 BILLION. ONE OF THE COMPARISONS THAT I WAS LOOKING FOR IS WHAT HAVE WE DONE FOR $150 BILLION? THE APOLLO PROGRAM IN THE MID-SIXTIES THAT PUT A MAN ON THE MOON. THAT MADE US ENORMOUSLY PROUD----A GREAT JOLT TO NATIONAL PRIDE----COST ABOUT $30 BILLION. IF YOU APPRECIATE $30 BILLION TO TODAY'S DOLLARS YOU ARE TALKING ABOUT $150 BILLION. WOULDN'T YOU SPEND THE SAME AMOUNT OF MONEY TO ENSURE OUR VALUES, OUR FREEDOMS? WOULDN'T YOU SPEND THAT MUCH MONEY TO ENSURE THAT YOU CAN CONTINUE TO PUBLISH WHAT YOU BELIEVE TO BE TRUE?

LET ME HAVE YOU TAKE A LOOK AT WHAT WE WERE DOING AT THE SAME TIME WE LAUNCHED THE APOLLO PROGRAM. WE HAD ENORMOUS ARMAMENT EXPENDITURES; 500,000 TROOPS ON THE GROUND IN VIETNAM WITH A LOGISTICS TAIL THAT WAS 10 THOUSAND MILES LONG. THE QUESTION IS NOT WHAT WE COULD DO BUT WHAT WE HAVE DONE AND HOW WE WOULD USE THAT MONEY TODAY.

THE THIRD ARGUMENT IS THAT IT IS NOT LEAKPROOF. WHAT A DEMAGOGIC ARGUMENT. I HEAR RESPONSIBLE PEOPLE SAYING, "WHAT GOOD DOES IT DO TO STOP 1,500 WARHEADS IF THEY'VE GOT 10,000 MORE. IF IT'S THE FIRST 1,500, IT MAKES A BIG DIFFERENCE BECAUSE THE TARGET OF

THOSE FIRST 1,500 HAS TO BE OUR RETALIATORY FORCES, INCLUDING THE BOMBERS THAT THESE YOUNG MEN FLY. IF WE CAN GET AIRBORNE, WE CAN ENSURE RETALIATION. THAT IS OUR DETERRENCE. THE PRESIDENT'S ABILITY TO DIRECT RETALIATION WOULD DETER THE SOVIETS TO ATTACK US. WHAT A DEMAGOGIC ARGUMENT.

LET ME JUST RELATE ONE MORE BAD EXPERIENCE THAT MY VICE COMMANDER HAD HERE IN WASHINGTON AT A PANEL MEETING. HE WAS ASKED A QUESTION----SOMEWHAT RHETORICALLY LIKE----"THE SOVIETS HAVE AN ANTISATELLITE AND WE DON'T; WE COULD BUILD AN ANTISATELLITE AND WE WOULD BOTH HAVE AN ANTISATELLITE OR WE COULD NEGOTIATE AWAY THEIR ANTISATELLITE AND NEITHER ONE OF US WOULD HAVE ONE. WHICH DO YOU BELIEVE IS THE BEST OF ALL WORLDS OR WHICH WOULD YOU PREFER?"

BEING A VERY HONEST PERSON, HE GAVE HIS ANSWER FIRST AND THEN WENT ON TO EXPLAIN HIS THOUGHTS. HE SAID, "IN A PERFECT WORLD IT WOULD BE DESIRABLE FOR NEITHER ONE OF US TO HAVE AN ANTISATELLITE. OUR SATELLITES ARE SO MUCH BETTER, SO MUCH FINER GRAIN, SO MUCH LONGER LIVED; THEY SPEED INFORMATION TO THE FORCES THAT NEED IT AND TO THE PRESIDENT AND THE NATIONAL COMMAND AUTHORITIES. IT WOULD BE BEST IF NEITHER ONE OF US HAD ONE. BUT OF COURSE, THEY ALREADY HAVE ONE; THEY AREN'T GOING TO GIVE IT UP AND DECIDE THAT ANTISATELLITES ARE NO LONGER TREATY

COMPLIANT. AND WHAT IS THE DEFINITION OF AN ANTISATELLITE? THE MIR COULD BE AN ANTISATELLITE; ANY SATELLITE COULD BE AN ANTISATELLITE WEAPON. YOU JUST HAVE ONE SATELLITE COLLIDE WITH ANOTHER SATELLITE. SO HE SAID BECAUSE YOU CANNOT NEGOTIATE AWAY THE ANTISATELLITE, THEN THE ONLY ACCEPTABLE SOLUTION IS FOR US TO BOTH HAVE THEM." BUT THE STORY LEAD WAS, "ADMIRAL RAMSEY AGAINST ASAT." I DON'T BELIEVE THAT WAS WHAT HE REALLY SAID, BUT THAT WAS WHAT WAS REPORTED.

WE MUST GET THE TRUTH OUT THROUGH THE MEDIA. YOU HAVE THE RESPONSIBILITY TO ENSURE THAT WHAT THE AVERAGE CITIZEN READS IS FACTUAL AND COMPLETE. YOU HAVE THE RESPONSIBILITY TO PROPERLY EDUCATE THIS GREAT NATION OF OURS.

LET ME LEAVE YOU WITH TWO THOUGHTS. ONE IS FROM MacARTHUR. I THINK WE SHOULD ALWAYS START WITH THIS THOUGHT IN MIND----WE IN THE MILITARY AND PERHAPS YOU IN THE MEDIA. MacARTHUR SAID, "THE SOLDIER ABOVE ALL OTHERS PRAYS FOR PEACE. BECAUSE HE ABOVE ALL OTHERS KNOWS FIRST HAND THE RAVAGES OF WAR." I DON'T KNOW ANYBODY WHO HAS BEEN IN COMBAT WHO DOESN'T WANT TO ENSURE THE PEACE. WE'RE A STRONG MILITARY SO THAT WE CAN UNDERWRITE THE FACT THAT WE DON'T HAVE TO FIGHT AGAIN.

AND I WILL LEAVE YOU WITH THE WORDS OF JOHN F. KENNEDY IN HIS INAUGURAL ADDRESS IN 1960, WHEN HE SAID, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG."

GOD BLESS YOU FOR THE WORK YOU DO IN HELPING KEEP AMERICA STRONG. WE NEED TO REDEDICATE OURSELVES TO THAT IMPORTANT ROLE. WE CAN AFFORD TO BE STRONG. WE CANNOT AFFORD TO BE WEAK. THANK YOU VERY MUCH.

GENERAL JOHN L. PIOTROWSKI, USAF
THE SECOND SPACE LOGISTICS SYMPOSIUM
COSTA MESA, CALIFORNIA
3 OCTOBER 1988

DISTINGUISHED GUESTS, INDUSTRY REPRESENTATIVES, MILITARY MEMBERS, LADIES AND GENTLEMEN, FRIENDS, AND PATRIOTS ALL. IT'S GREAT TO BE WITH YOU AND TO PARTICIPATE IN THIS EFFORT TO IMPROVE OUR LOGISTICS POSTURE AND TO BUILD TOWARD A BETTER LOGISTICS FUTURE.

ONE OF THE THINGS I LEARNED AS A STUDENT AT THE HENRY FORD TRADE SCHOOL WAS TO "USE THE RIGHT TOOL FOR THE RIGHT JOB." WHEN I LATER JOINED THE AIR FORCE, THIS THEME----IN ONE FORM OR ANOTHER----RECURRED AGAIN AND AGAIN.

IN ARCHITECTURE THIS THEME IS REFLECTED IN THE PRINCIPLE THAT THE "FORM" A STRUCTURE TAKES SHOULD FOLLOW THE "FUNCTION" FOR WHICH IT IS INTENDED. IN ENGINEERING, AS YOU ALL KNOW, IT IS IMPERATIVE THAT THE RIGHT MATERIAL BE SELECTED TO ACHIEVE THE DESIRED STRENGTH. AND OF COURSE, THE HISTORY OF WARFARE, VIRTUALLY WITHOUT EXCEPTION, POINTS TO THE IMPERATIVE----"USE THE RIGHT TOOL FOR THE RIGHT JOB."

AS CRITICAL AS THIS PRINCIPLE IS, IT CONTINUES TO BE IGNORED. THE CONSEQUENCES OF THIS IGNORANCE, ESPECIALLY IN THE MILITARY, RESULTS IN SIGNIFICANT RISKS----AND, AS SHOWN BY HISTORY, QUITE OFTEN DEFEAT. I AM CONCERNED THAT WE MAY HAVE FORGOTTEN THIS PRINCIPLE WHEN CONSTITUTING OUR MILITARY SPACE FORCES.

U.S. SPACE FORCES, INCLUDING LAUNCH SYSTEMS, SATELLITES, AND COMMAND AND CONTROL SYSTEMS, ARE CERTAINLY MARVELOUS PIECES OF HARDWARE----HARDWARE DESIGNED PRIMARILY TO SUPPORT U.S. PEACETIME REQUIREMENTS. HOWEVER, AS A TOOL TO ACHIEVE WARTIME MILITARY OBJECTIVES, THE U.S. SPACE INFRASTRUCTURE FALLS SHORT. FROM A MILITARY VIEWPOINT, EXISTING SPACE FORCES MAY NOT BE ADEQUATE FOR THE JOB----SHOULD DETERRENCE FAIL.

THIS IS A WORRISOME SITUATION----IT MUST BE CORRECTED. I THINK THIS SYMPOSIUM----YOU SCIENTISTS, ENGINEERS, AND LOGISTICIANS ASSEMBLED HERE, TO DISCUSS THE SUSTAINABILITY AND VIABILITY OF OUR NATION'S SPACE PROGRAM----CAN BEGIN THE PROCESS OF CHANGE. CHANGES ARE NECESSARY IF FUTURE MILITARY SPACE OPERATIONS, ARE TO SUPPORT THE WARFIGHTING CINCs DURING A CONFLICT, INSTEAD OF JUST PRIOR TO THE CONFLICT.

MY VIEW OF WHY TODAY'S SPACE FORCES MIGHT NOT BE ADEQUATE FOR SUPPORTING MILITARY FORCES----ARE STRAIGHTFORWARD----SO ARE THE SOLUTIONS. AND WHILE ACHIEVING THE TRANSITION FROM WHAT IS LARGELY A PEACETIME SPACE FORCE TO ONE THAT CAN ENDURE IN A CONFLICT TAKES DOLLARS AND TIME----THE CHANGES REQUIRED DO NOT INVOLVE PUSHING THE STATE OF THE ART.

FOR EXAMPLE, TWO CLOSELY RELATED CHARACTERISTICS ESSENTIAL IN MILITARY FORCES ARE RESPONSIVENESS AND DEPTH. THESE CHARACTERISTICS ARE REQUIRED IN SPACE, JUST AS THEY ARE REQUIRED FOR LAND, SEA, AND AIR FORCES. EVALUATING THE EXISTING SPACE INFRASTRUCTURE AGAINST RESPONSIVENESS AND DEPTH ACCENTUATES THE SHORTCOMINGS THAT WOULD APPEAR DURING A CONFLICT----AND THE NEED FOR CHANGE.

BECAUSE OF THE WARFIGHTER'S EVER-INCREASING DEPENDENCE ON SPACE-BASED SYSTEMS, RESPONSIVENESS IS ABSOLUTELY ESSENTIAL IN A CONFLICT. MATERIALS ARE CONSUMED IN COMBAT. THAT'S A FACT BORNE OUT BY MORE THAN 2,000 YEARS OF WARFARE. WE CURRENTLY PREPARE FOR THE LOSS OF TANKS, SHIPS, AND AIRCRAFT. WE MUST ALSO, IN LIKE FASHION, PREPARE FOR THE LOSS OF SPACE SYSTEMS. IT IS UNREASONABLE AND IMPRUDENT NOT TO EXPECT THAT SATELLITES, SENSOR SITES, PROCESSING

AND CONTROL CENTERS, AND EVEN LAUNCH FACILITIES, MAY BE LOST IN COMBAT. THEREFORE, THE SIDE THAT CAN RAPIDLY REPLENISH ITS LOSSES WILL BE THE SIDE THAT CAN MAINTAIN THE TACTICAL ADVANTAGE IN WAR.

WE MUST BE ABLE TO ENSURE THE SUSTAINABILITY OF THOSE CRITICAL FUNCTIONS DERIVED FROM SPACE. A RESPONSIVE LAUNCH SYSTEM TO RECONSTITUTE COMBAT LOSSES IS ONE WAY TO ACHIEVE SUSTAINABILITY. WHILE OUR LAUNCH "TOOLS" ARE ADEQUATE FOR PEACETIME, THEY FALL FAR SHORT OF MEETING THE DEMANDS OF COMBAT.

THE SOVIETS, ON THE OTHER HAND, HAVE DEVELOPED LAUNCH SYSTEMS THAT CAN MEET THE STRESSES OF COMBAT. DURING HIS TRIP WITH SECRETARY CARLUCCI TO THE SOVIET UNION THIS PAST SUMMER, GENERAL CROMER GAINED SOME VALUABLE INSIGHTS INTO HOW THE SOVIETS ACHIEVE A ROBUST LAUNCH CAPABILITY. ONE THING THEY DO IS BUILD THEIR LAUNCH SYSTEMS IN PARALLEL----TWO BOOSTERS AND PAYLOADS ARE PREPARED FOR LAUNCH TOGETHER. THIS ALLOWS THEM TO SELECT THE BEST SYSTEM FOR THE LAUNCH AND PROVIDES A READY BACKUP SHOULD PROBLEMS ARISE. CLEARLY THEY HAVE DEVELOPED FLEXIBILITY INTO THEIR LAUNCH PROCESSES.

SPEED AND FLEXIBILITY----KEY COMPONENTS OF RESPONSIVENESS----ARE NOT CHARACTERISTICS OF EXISTING U.S. LAUNCH SYSTEMS. LAUNCH RESPONSIVENESS, WHICH INCLUDES LAUNCH PAD PREPARATIONS, SATELLITE AND BOOSTER INTEGRATION, AND ON-ORBIT CHECKOUT, MUST BE IMPROVED.

A SIXTY-DAY LEAD TIME----THE LEAD TIME EXPECTED FOR A LAUNCH OF A SCOUT, OUR SIMPLEST BOOSTER, WITH OUR LEAST COMPLEX, MOST MATURE SATELLITE, A TRANSIT----IS NOT ACCEPTABLE TO BATTLE GROUP COMMANDERS ENGAGED IN COMBAT. FORCE REPLENISHMENT MEASURED IN YEARS, MONTHS, OR EVEN WEEKS WILL NOT SUPPORT THE BATTLEFIELD COMMANDER.

SO WHAT IS TO BE DONE? OPERATIONAL CONSIDERATIONS----THOSE DESIGN FEATURES THAT INCREASE THE UTILITY FOR THE WARFIGHTER----NEED TO BE GIVEN TOP PRIORITY. WE NEED TO BUILD BOOSTERS AND SATELLITES LIKE WE BUILD SHIPS, TANKS, AND AIRPLANES----TO BE OPERATED BY HIGHLY TRAINED HIGH SCHOOL GRADUATES. WE ALSO NEED TO BUILD THEM IN LARGER NUMBERS.

MOREOVER, WARFIGHTERS NEED THE RESPONSIVENESS AFFORDED BY BEING ABLE TO PUT A SMALL, YET CRITICAL PAYLOAD, ON ANY BOOSTER, IF NECESSARY. DESIGNING A ONE-TO-ONE MATCH BETWEEN BOOSTERS AND PAYLOADS

NEGATES MUCH OF THE FLEXIBILITY SO NECESSARY FOR RESPONSIVENESS. FOR EXAMPLE, WE WOULD LAUNCH A C-5 WITH A SINGLE PALLET IF THE SUPPLIES ON THE PALLET MEANT WINNING OR LOSING AND THE C-5 WAS THE ONLY AIRCRAFT IMMEDIATELY AVAILABLE. WE WOULDN'T HOLD SUCH A CRITICAL SHIPMENT FOR A FULL C-5 LOAD----NOR WOULD WE WAIT FOR A SMALLER AIRCRAFT. UNFORTUNATELY, WE DO NOT HAVE THIS KIND OF FLEXIBILITY IN THE MATCHING OF BOOSTER AND PAYLOAD.

WE PRIDE OURSELVES FOR NO LONGER BEING SINGLE THREAD. IN ADDITION TO THE SHUTTLE, WE HAVE OR ARE BUILDING SEVERAL EXPENDABLE LAUNCH VEHICLES.

THE CALL-UP AND PAYLOAD CHANGE OUT CRITERIA ESTABLISHED FOR THE ALS, IS A GREAT MOVE IN IMPROVING RESPONSIVENESS. BUT WE CAN'T AFFORD TO WAIT FOR ALS TO CORRECT THESE SERIOUS OPERATIONAL SHORTFALLS IN OUR NEW STABLE OF BOOSTERS. THE DELTA II, ATLAS II, TITAN II AND IV----NEED SIGNIFICANT UPGRADES IN FLEXIBILITY AND RESPONSIVENESS.

I MENTIONED THAT A RESPONSIVE LAUNCH SYSTEM WAS ONE WAY TO ENSURE THE SUSTAINABILITY OF ESSENTIAL SPACE CAPABILITIES. FORCES IN DEPTH ALSO CONTRIBUTE TO ASSURED MISSION CAPABILITIES.

TODAY'S EXISTING SPACE FORCES LACK DEPTH. THE POPULATION OF ON-ORBIT SPARES----OR "READY RESERVES" IF YOU WILL----IS MINISCULE. THIS "THIN BLUE LINE" WOULD BE TOLERABLE IF WE COULD RAPIDLY REINFORCE IT. TODAY, WE ARE FACED WITH THREE UNSATISFACTORY SITUATIONS SIMULTANEOUSLY: TOO FEW ON-ORBIT RESERVES, TOO FEW GROUND SPARES, AND EXCESSIVE REPLENISHMENT TIMES. ALL AT A TIME WHEN THE SOVIETS HAVE MULTIPLE COMBAT-READY ANTISATELLITE CAPABILITIES. MOREOVER OUR FIELD FORCES HAVE LEARNED TO EXPECT ROBUST SPACE SUPPORT----BUT WHILE THE EXISTING "THIN BLUE LINE" IS ENORMOUSLY CAPABLE AND FINE GRAIN, IT IS LIMITED IN BOTH SCOPE AND DEPTH.

FURTHER, TODAY'S SPACE FORCE IS ONE DIMENSIONAL. IT HAS NO OFFENSIVE CAPABILITY. WE LACK THE TOOLS TO DENY THE ENEMY THE COMBAT SUPPORT HE DERIVES FROM HIS SPACE SYSTEMS AND WE LACK THE RESOURCES TO DEFEND AGAINST HIS ATTACKS ON OUR OWN SPACE FORCES. TODAY'S SPACE FORCES LACK DEPTH IN TERMS OF RESERVES AND IN TERMS OF DEFENSIVE CAPABILITIES----FUNDAMENTAL CHARACTERISTICS FOR MILITARY FORCES OPERATING ON LAND, AT SEA, AND IN THE AIR.

TO CORRECT THIS LACK OF DEPTH, CHANGES ARE NECESSARY ON TWO FRONTS----BOTH QUANTITY AND SUSTAINABILITY. PLANNING FOR RESERVES----SPARE SATELLITES----IS EASY TO DO, BUT NOT ALWAYS EASY TO

FUND. TOGETHER WE MUST PURSUE THAT FUNDING, AND YOU MUST DESIGN AND BUILD REPLACEMENTS THAT CAN PERHAPS, BE STORED OUT OF HARM'S WAY IN A DORMANT STATE ON ORBIT, AND RAPIDLY BROUGHT TO AN OPERATIONAL STATUS TO SUPPORT THE TERRESTRIAL WARFIGHTERS.

IN ADDITION TO PROLIFERATION, WE CAN ALSO ENHANCE DEPTH BY DESIGNING INTO OUR SATELLITES INCREASED SURVIVABILITY, HARDENING, AND MANEUVERABILITY FEATURES. ANOTHER POSSIBILITY MIGHT BE THE REPAIR OF FAILED OR DAMAGED SATELLITES IN ORBIT. JUST AS WE DEPLOY LOGISTICS SUPPORT SHIPS WITH THE FLEET, ORBITING LOGISTICS DEPOTS MIGHT BE ONE OF SEVERAL POSSIBLE SOLUTIONS IN SPACE.

WE MUST ALSO MOVE AHEAD WITH A U.S. ANTISATELLITE CAPABILITY. PROLIFERATION, HARDENING, AND MANEUVERABILITY ALL CONTRIBUTE TO DEPTH OF FORCES AND ASSURED MISSION CAPABILITY. BUT THAT'S NOT ENOUGH. AN ANTISATELLITE CAPABILITY IS ESSENTIAL, ESPECIALLY IN LIGHT OF THE CONTINUED GROWTH OF SOVIET OPERATIONAL SPACE SUPPORT AND CONTROL CAPABILITIES. BUT THAT IS A TOPIC FOR ANOTHER AUDIENCE.

THIS SECOND SPACE LOGISTICS SYMPOSIUM IS CERTAINLY A GOOD OPPORTUNITY TO MOLD THE CHARACTER OF FUTURE SPACE FORCES. SESSIONS LIKE SPACE LOGISTICS CONCEPTS AND CHALLENGES, THE INFLUENCE OF LOGISTICS ON SPACE

HARDWARE DESIGN, AND THE LOGISTICS SUPPORT OF ORBITAL-BASED SYSTEMS HAVE ENORMOUS POTENTIAL TO ENHANCE THE CAPABILITIES OF U.S. AND ALLIED TERRESTRIAL MILITARY FORCES.

THROUGHOUT YOUR WEEK HERE, AND AS YOU DESIGN AND SUPPORT THE SPACE SYSTEMS THAT U.S. AND ALLIED MILITARY FORCES DEPEND ON, I WOULD ASK YOU TO GRADE EACH ALTERNATIVE AGAINST THE PILLARS OF DEFENSE: MODERNIZATION, FORCE STRUCTURE, READINESS, AND SUSTAINABILITY. IF THE CHOICES DON'T IMPROVE THESE MEASURES OF OUR MILITARY SPACE FORCES, THEY DON'T SERVE THE WARTIME NEEDS OF OUR THEATER COMMANDERS----AND THE SPACE SYSTEMS WILL NOT BE THERE WHEN THEY ARE REALLY NEEDED.

GENERAL JOHN L. PIOTROWSKI, USAF
"SDI TESTING - THE ROAD TO SUCCESS"

INTERNATIONAL TEST AND EVALUATION ASSOCIATION
SYMPOSIUM '88

COLORADO SPRINGS, COLORADO
5 OCTOBER 1988

DISTINGUISHED GUESTS AND NOTABLE SPEAKERS, FELLOW GENERAL OFFICERS, ASSOCIATES FROM COLORADO SPRINGS, ITEA MEMBERS, LADIES AND GENTLEMEN, PATRIOTS ALL. IT'S REALLY A PLEASURE TO LOOK AT THE AGENDA THAT YOU HAVE BEFORE YOU BECAUSE AS A POTENTIAL OPERATOR OF A BALLISTIC MISSILE DEFENSE SYSTEM THAT WOULD PROTECT THIS GREAT NATION OF OURS I'M CERTAINLY EXCITED AND INTERESTED IN YOUR PROGRAM.

I AM CONVINCED THAT ALL OF US THAT CARE ABOUT OUR PEOPLE, WHO CARE ABOUT WINNING, WHO CARE ABOUT SPENDING THE AMERICAN TAXPAYERS' DOLLARS FOR THE RIGHT THING, INSIST ON RIGOROUS, HONEST, PRUDENT TEST AND EVALUATION PROGRAMS TO MAKE SURE THAT WHAT WE BUY, WHAT WE FIELD, WHAT WE PUT OUR TROOPS INTO BATTLE IN, IS THE BEST THAT WE CAN BUY AND MEETS THE INTENDED PURPOSE. THAT'S THE IMPORTANT THING----THE INTENDED PURPOSE OF WHATEVER IT IS WE ARE TESTING, AND HAVE WE TESTED IT APPROPRIATELY.

IT HARDLY SEEMS LIKE FIVE YEARS SINCE THE UNITED STATES FIRST EMBARKED ON THE NOBLE ENTERPRISE THAT YOU'RE GOING TO DISCUSS THIS MORNING----THE FINDING OF ALTERNATIVES TO NUCLEAR TERRORISM. WHEN PRESIDENT REAGAN ADDRESSED THE AMERICAN PEOPLE IN MARCH 1983, HE SAID IT WAS TIME TO TURN THE GREAT TECHNOLOGICAL MIGHT OF THE UNITED STATES AWAY FROM INVENTING MORE WEAPONS OF DESTRUCTION, AND TOWARDS CREATING NEW INSTRUMENTS OF PEACE----DEFENSE TECHNOLOGIES THAT HARM NO ONE. HE ALSO SAID THAT IT WOULD PROBABLY TAKE DECADES OF EFFORT TO DEVELOP THE MEANS OF RENDERING BALLISTIC MISSILES IMPOTENT AND OBSOLETE.

I THINK THAT MOST IN THIS ROOM WOULD AGREE WITH ME AND WITH OTHERS THAT THE TECHNOLOGICAL CHALLENGE WAS PROBABLY OVERESTIMATED----WITH THE TECHNOLOGIES PROGRESSING MUCH MORE RAPIDLY THAN ANYONE EVER EXPECTED. AND I'M SURE THAT THE RAPID PROGRESS WAS PROBABLY BECAUSE OF THE INGENUITY AND SUPPORT OF A LOT OF PEOPLE IN THIS ROOM.

BUT WHILE WE'VE MADE ASTOUNDING BREAKTHROUGHS IN TECHNOLOGY, BREAKTHROUGHS THAT ARE WELL AHEAD OF OUR EXPECTATIONS, WE'VE FALLEN SHORT IN OUR EFFORTS TO CONVINCE AND EDUCATE THE AMERICAN PEOPLE THAT DEFENSES AGAINST BALLISTIC MISSILES WILL NOT ENSURE ONLY A BETTER FUTURE----BUT A FUTURE PERIOD.

PRESIDENT REAGAN SAID IT MOST ELOQUENTLY IN A SPEECH TO THE INSTITUTE FOR FOREIGN POLICY WHEN HE SAID AND I QUOTE, "IF THERE'S ONE THING WE'VE LEARNED OVER THE PAST FIVE AND A HALF YEARS, IT IS THAT IT IS SOMETIMES EASIER TO BREAK IN NEW TECHNOLOGIES THAN NEW THINKING."

LET ME TELL YOU WHAT I SEE IN TERMS OF THE STRATEGIC DEFENSE INITIATIVE. I SEE THAT TODAY, OUR FUTURE IS IN THE HANDS OF THE SOVIET UNION----BECAUSE THEY HAVE THE ABILITY TO DESTROY US AND EVERYTHING WE CHERISH----IDEALS, VALUES, HUMAN DIGNITY----AT THEIR WILL. IT IS CLEAR THAT IT'S TIME TO TAKE OUR FUTURE BACK IN OUR OWN HANDS. THERE SEEM TO BE FOUR ARGUMENTS AGAINST THE STRATEGIC DEFENSE INITIATIVE----IT WON'T WORK, IT COSTS TOO MUCH, IT WOULD INVITE THE SOVIETS TO ATTACK, AND IT'S NOT LEAKPROOF. LET ME JUST BRIEFLY TELL YOU HOW I FEEL ABOUT THIS.

IT WON'T WORK. THERE ARE THREE GROUPS OF SCIENTISTS----THOSE WHO SAY THAT WE SHOULD START FIELDING IT RIGHT AWAY; THOSE WHO SAY THAT IT NEEDS A LITTLE MORE WORK; AND THOSE WHO SAY THAT IT WON'T WORK. I THINK THAT THE BURDEN OF PROOF IS ALREADY RESOLVED BECAUSE THE SOVIETS HAVE ALREADY FIELDED A

BALLISTIC MISSILE DEFENSE SYSTEM. AND IN FACT, WE SEE THEM LAUNCH THEIR REENTRY VEHICLES AND WE SEE THEM INTERCEPT THEM WITH THEIR INTERCEPTORS. SO WE KNOW THAT THEY HAVE A SYSTEM, WE KNOW THAT THEY TEST IT, AND WE BELIEVE THAT IT WORKS.

NOW, AS FAR AS COSTING TOO MUCH----IT IS INTERESTING THAT WHILE THE DEBATE RAGES ON WHETHER WE CAN AFFORD A PHASE I BALLISTIC MISSILE DEFENSE SYSTEM, THIS NATION IS EMBARKED ON A MULTI-BILLION PROGRAM FOR A SPACE STATION. I SUPPORT THE SPACE STATION, BUT I DON'T SUPPORT IT AHEAD OF DEFENDING AMERICA. WHEN PRESIDENT KENNEDY CHALLENGED THIS NATION TO PUT MEN ON THE MOON, WE SPENT $30 BILLION IN 1960 DOLLARS TO PUT NEIL ARMSTRONG ON THE MOON AND TAKE THAT FIRST GIANT STEP FOR MANKIND. IF YOU TOOK THOSE $30 BILLION AND APPRECIATED THEM TO 1990 DOLLARS, WE'RE TALKING ABOUT $120 TO $150 BILLION. SO IF WE COULD SPEND $120 TO $150 BILLION ON THE APOLLO PROGRAM, CLEARLY WE CAN SPEND A LIKE AMOUNT OF MONEY TO ENSURE THE DEFENSE AND FUTURE OF AMERICA. IRONICALLY, AT THE SAME TIME WE FUNDED THE APOLLO PROGRAM, WE HAD 500 THOUSAND TROOPS ON THE GROUND IN VIETNAM. CLEARLY THIS NATION HAS DEMONSTRATED THAT IT IS WILLING AND CAN SPEND THOSE KINDS OF DOLLARS AND I THINK WE SHOULD.

THE ARGUMENT THAT IT WOULD INVITE THE SOVIETS TO ATTACK IS RIDICULOUS. THE SOVIETS AREN'T GOING TO INVITE THEIR OWN DESTRUCTION BY ATTACKING US BECAUSE WE'RE DOING WHAT THEY HAVE ALREADY DONE. IN FACT, THEY WOULD BE DETERRED FROM THE ATTACK.

AND LASTLY, IT'S NOT LEAKPROOF. IT DOESN'T HAVE TO BE LEAKPROOF. WHAT IS IMPORTANT IS THE FACT THAT THEY WOULD NOT ATTACK IN THE FIRST INSTANCE IF THEY KNEW THAT THEIR FIRST WAVE WOULD BE AN ABSOLUTE FAILURE. SO THE ANSWER IS----WE CAN AFFORD IT, IT CAN WORK, AND WE CAN TEST IT.

AS MOST OF YOU KNOW, WE HAVE A LOT OF VISITORS THROUGH THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND AND CHEYENNE MOUNTAIN. WHEN THEY GO THROUGH THE COMMAND POST, WE LIKE TO SHOW THEM A SCENARIO OF A BALLISTIC MISSILE ATTACK AND HOW WE COPE WITH THAT IN TERMS OF ASSESSING IT, EVALUATING IT, AND SPEEDING THE INFORMATION TO THE NATIONAL COMMAND AUTHORITIES. BUT IF I HAD A NICKEL FOR EVERY PERSON THAT DIDN'T REALIZE----THAT WAS COMPLETELY UNAWARE THAT THE UNITED STATES HAS ABSOLUTELY ZERO DEFENSES AGAINST THAT KIND OF ATTACK----NO WAY OF PREVENTING

THE WHOLESALE DESTRUCTION OF AMERICAN LIVES ENSUED----I WOULD HAVE ENOUGH MONEY TO FIELD A PHASE I SYSTEM. IN FACT, WE GET 20,000 VISITORS THROUGH A YEAR AND 19,950 BELIEVE THAT WE HAVE A MEANS OF DEFENDING AMERICA.

THERE ARE STILL THOSE WHO SEE SPACE AS A REMOTE, MYSTERIOUS REALM----WHO BELIEVE THAT THE SOVIET PROPAGANDA THAT WE ARE MILITARIZING SPACE. SPACE WAS MILITARIZED BY THE GERMANS WHEN THEY LAUNCHED THE FIRST V-2 ROCKET.

THERE ARE STILL THOSE WHO DO NOT REALIZE THAT THE SOVIETS HAVE DEPLOYED A SYSTEM----AN ANTIBALLISTIC MISSILE SYSTEM----FOR 20 YEARS AND HAVE SPENT 15 TIMES THE AMOUNT OF MONEY THAT THIS NATION HAS SPENT ON BALLISTIC MISSILE RESEARCH OR THE STRATEGIC DEFENSE INITIATIVE.

THERE ARE STILL THOSE THAT DO NOT REALIZE THAT THE SOVIETS CAN DESTROY OUR SATELLITES AND WE HAVE NO IN-KIND RESPONSE.

THERE ARE STILL THOSE WHO BELIEVE IT ACCEPTABLE, IF NOT EXPECTED, TO TEST GROUND SYSTEMS ON THE GROUND BEFORE WE DEPLOY THEM----AND I SUPPORT THAT. TO TEST ATMOSPHERIC SYSTEMS IN THE AIR BEFORE WE FIELD THEM----AND I STRONGLY SUPPORT THAT. TO TEST

MARITIME SYSTEMS AT SEA BEFORE WE SEND THEM TO THE FLEET----AND I SUPPORT THAT. BUT THEY ALSO BELIEVE THAT TESTING SPACE SYSTEMS IN SPACE BEFORE DEPLOYMENT WOULD BE IMMORAL AND INSANE AND AGGRESSIVE----AND I DON'T BELIEVE THAT. WE NEED TO TEST. WE NEED TO TEST REALISTICALLY AND WE NEED TO TEST RIGOROUSLY.

AND WORSE, THERE ARE STILL THOSE WHO BELIEVE THAT THE STRATEGIC DEFENSE INITIATIVE SIGNALS THE ABANDONMENT OF DETERRENCE RATHER THAN A WAY TO FORTIFY IT----AN IMPROVE DETERRENCE BASED ON A BALANCE OF OFFENSE AND DEFENSE RATHER THAN THE THREAT OF RETALIATION ALONE.

I'M NOT HERE THIS MORNING TO ELABORATE ON THE SHORTFALLS----BUT RATHER TO CONGRATULATE AND THANK ALL OF YOU WHO CONTRIBUTE EACH DAY TO THE SUCCESSFUL AND HOPEFUL EMPLOYMENT OF A BALLISTIC MISSILE DEFENSE SYSTEM. AND ALL THOSE OTHER IMPORTANT SYSTEMS THAT ARE VITAL IN SUPPORT OF OUR NATIONAL DEFENSE. I'M HERE TO OPEN WHAT WILL UNDOUBTEDLY BE A KEY ELEMENT IN THE SUCCESS OF ALL THOSE IMPORTANT PROGRAMS----BUT SPECIFICALLY BALLISTIC MISSILE DEFENSE AND ITS TESTABILITY. IT MUST BE PROVEN TO BE UNAMBIGUOUS, HIGHLY RELIABLE, ENJOY A GREAT DEAL OF REDUNDANCY WITHOUT COMPLEXITY, AND BE RESPONSIVE TO A VARIETY OF THREATS.

I'M CONFIDENT THAT YOUR EFFORTS WILL CONTINUE THE CHAIN OF EVENTS THAT CAN----AND I HOPE WILL, AND I BELIEVE MUST----RESULT IN A SAFER FORM OF DETERRENCE.

I WILL LEAVE YOU WITH A WORD FROM TWO SPEAKERS; FIRST, JOHN F. KENNEDY. HE SAID, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG." I BELIEVE THAT IS ONE OF THE MOST PROFOUND STATEMENTS THAT I HAVE EVER READ. WE CAN AFFORD TO BE STRONG, WE CANNOT AFFORD TO BE WEAK. WE ARE THE BEACON OF THE FREE WORLD.

AND LASTLY, THE WORDS OF REVEREND CAMPBELL, SPEAKING AT THE RIVERSIDE CHURCH IN NEW YORK, WHO SAID, "WE'RE NOT WHAT WE USED TO BE, WE'RE NOT WHAT WE OUGHT TO BE, WE'RE NOT WHAT WE'RE GOING TO BE, BUT WE'RE MOVING." AND WE ARE MOVING IN THE FIELD OF IMPROVING OUR ABILITY TO TEST AND EVALUATE AND FIELD GOOD WEAPONS. I CONGRATULATE YOU FOR THE WORK YOU DO IN MAKING AND KEEPING AMERICA STRONG AND GIVING OUR SOLDIERS, SAILORS, AND AIRMEN THE BEST WEAPON FOR THE JOB THAT THEY ARE ASKED TO DO FOR THE MONEY THAT WE SPENT ON IT.

GOD BLESS YOU ALL, I WISH YOU EVERY SUCCESS FOR YOUR CONFERENCE. THANK YOU.

GENERAL JOHN L. PIOTROWSKI, USAF
THE HAGUE, NETHERLANDS
NEW DIMENSION: THE MILITARY APPLICATION OF SPACE
14 OCTOBER 1988

IT'S AN HONOR TO BE HERE AND A PARTICULAR HONOR TO BE INVITED TO PARTICIPATE IN THIS SYMPOSIUM AND TO SHARE IN THE CELEBRATION OF THE 75TH ANNIVERSARY OF THE GREAT AIR FORCES HERE.

I'D LIKE TO POINT OUT THAT AS THE COMMANDER OF THE UNITED STATES SPACE COMMAND, IT'S MY GOAL TO ENSURE THAT FIELD FIGHTERS HAVE THE BENEFIT OF THOSE THINGS THAT CAN BE DERIVED FROM SPACE AND ONE OF OUR IMPORTANT GOALS IS TO ENSURE THAT ANYBODY THAT CAN AFFORD AN ANTENNA----AFFORD IN TERMS OF MOVING AND RIGHT NOW THAT MEANS VISIBLE----AN ANTENNA THE SIZE OF THAT BEAUTIFUL TAPESTRY, CAN RECEIVE SPACECRAFT INFORMATION THAT IS IMPORTANT TO THE OUTCOME OF A LAND, SEA, OR AIR BATTLE.

THE MILITARY HAS ONLY BEEN REALLY INVOLVED IN SPACE FOR THE LAST THREE YEARS. PRIOR TO THE BIRTH IN OCTOBER 1985 OF THE UNITED STATES SPACE COMMAND, SPACE HAD BEEN IN THE HANDS OF THE SCIENTISTS AND ENGINEERS. WHILE THEY HAVE DONE AN ENORMOUSLY GOOD JOB----WE HAVE VERY LOCALIZED AND VERY FINE GRAIN

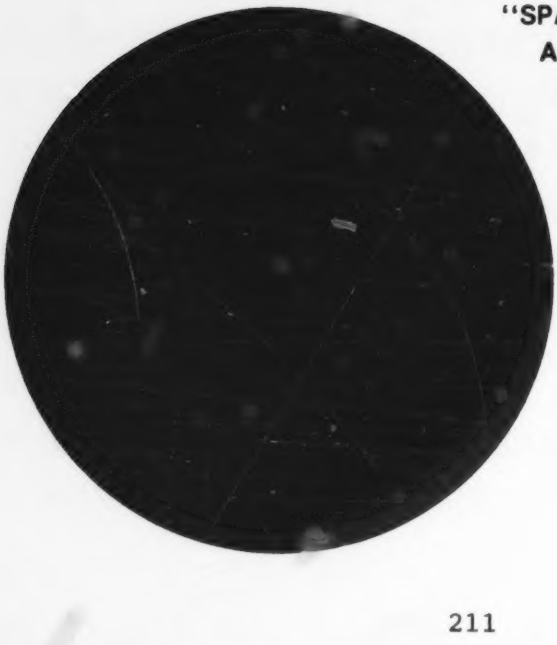
SATELLITES SERVING OUR COUNTRY----THEY DIDN'T DO IT WITH THE VIEW THAT THESE WERE WARFIGHTING PIECES OF EQUIPMENT, PIECES OF EQUIPMENT THAT NEEDED TO SERVE SOLDIERS, SAILORS, AIRMEN, AND MARINES.

I WANT TO TELL YOU NOW AND I WILL TELL YOU AGAIN AND AGAIN THAT SPACE THINGS DON'T EXIST FOR THEMSELVES. SPACECRAFT TODAY ONLY EXIST TO ENSURE THAT SOLDIERS, SAILORS, AIRMEN, AND MARINES HAVE THE BEST POSSIBLE SUPPORT AND INFORMATION SO THEY CAN DO THEIR JOB EFFICIENTLY AND AT THE LOWEST COST IN TERMS OF HUMAN LIVES. THAT'S THE PURPOSE OF SPACE. PERHAPS IN HUNDREDS OF YEARS, WE WILL HAVE INTERPLANETARY OR INTERGALACTIC MILITARY CAPABILITIES AND THEN . . . MAYBE . . . SPACE WILL BE FOR SPACE'S SAKE.

AGAIN, IT IS INDEED A PLEASURE TO BE HERE THIS MORNING TO HONOR THE ROYAL NETHERLANDS AIR FORCE ON ITS 75TH ANNIVERSARY. THE THEME OF THIS SYMPOSIUM----THE FUTURE OF AIR POWER----IS A TESTAMENT, I'M CONVINCED, TO THE FORWARD-LOOKING NATURE OF YOUR AIR FORCE AND, GIVEN THAT NATURE, I WAS NOT THE LEAST BIT SURPRISED AT YOUR INTEREST IN "A NEW DIMENSION----THE MILITARY APPLICATION OF SPACE." AND I'M HONORED TO SPEAK ON THIS SUBJECT.

THIS MORNING I WILL DEAL WITH MILITARY SPACE OPERATIONS AND HOW THESE OPERATIONS SUPPORT U.S., AND ALLIED MILITARY FORCES ON LAND, AT SEA, AND IN THE AIR. AGAIN, THAT'S THE ONLY REASON WE EXIST.

I'LL BRIEFLY REVIEW U.S. MILITARY SPACE POLICY AND THEN DISCUSS THOSE MISSIONS THAT ARE BEST DONE IN SPACE, TO SUPPORT OUR TERRESTRIAL MILITARY FORCES. SINCE THIS SUPPORT IS SO ESSENTIAL----NOT ONLY IN PEACE BUT THROUGHOUT THE ENTIRE SPECTRUM OF CONFLICT----I WILL ALSO ADDRESS THE CORRELATION OF FORCES IN SPACE----FOCUSING ON SOVIET WARTIME SPACE CAPABILITIES AND THE THREAT THESE CAPABILITIES POSE TO U.S. AND ALLIED FORCES.

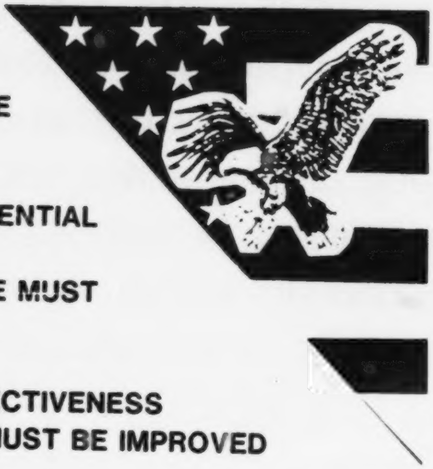


> "SPACE IS RECOGNIZED AS BEING A MEDIUM WITHIN WHICH THE CONDUCT OF MILITARY OPERATIONS IN SUPPORT OF OUR NATIONAL SECURITY CAN TAKE PLACE, JUST AS ON LAND, AT SEA, AND IN THE ATMOSPHERE.."
>
> • DOD SPACE POLICY •
>
> 4 FEB 1987

LET ME BEGIN BY SAYING THAT THE IMPORTANCE OF SPACE TO FUTURE AIR POWER, AND FOR THAT MATTER TO ALL FUTURE MILITARY OPERATIONS, CANNOT BE OVERSTATED. SPACE IS NO LONGER A DOMAIN RESTRICTED TO SCIENTISTS AND ENGINEERS. IT HAS BECOME----AND WILL CLEARLY REMAIN----AN ARENA FOR SUPPORTING AND CONDUCTING MILITARY OPERATIONS. SPACE OFFERS ADVANTAGES THAT WE CAN AND MUST AND WILL EXPLOIT FOR THE SOLDIER, SAILOR, AIRMAN, AND MARINE.

IN THE UNITED STATES, REQUIREMENTS FOR MILITARY SPACE OPERATIONS ARE CODIFIED IN DEPARTMENT OF DEFENSE SPACE POLICY AND WERE REAFFIRMED LAST JANUARY IN THE NATIONAL SECURITY STRATEGY SIGNED BY PRESIDENT REAGAN, WHERE HE STATED THAT, "THE USE OF SPACE SYSTEMS TO SATISFY MANY CRITICAL NATIONAL SECURITY REQUIREMENTS IS AN EXPANDING AND VITAL ELEMENT OF U.S. NATIONAL POWER." MOVING NOW, FROM THIS BROAD OVERARCHING POLICY TO THE MORE SPECIFIC----FOUR ELEMENTS ARE FUNDAMENTAL TO U.S. MILITARY POLICY FOR SPACE.

U.S. MILITARY POLICY FOR SPACE



- DETERRENCE CANNOT BE ACCOMPLISHED WITHOUT SPACE ASSETS
- FREE ACCESS TO SPACE IS ESSENTIAL
- DEFENSE CAPABILITIES IN SPACE MUST BE DEVELOPED
- SPACE SYSTEMS ENHANCE EFFECTIVENESS OF TERRESTRIAL FORCES AND MUST BE IMPROVED

THESE ELEMENTS ARE FOCUSED SQUARELY ON THE MILITARY APPLICATION OF SPACE----SUPPORTING U.S. AND ALLIED FORCES WORLDWIDE. THEY BEGIN WITH THE TENET THAT DETERRENCE, AT ANY LEVEL OF CONFLICT, CAN BE ENHANCED SIGNIFICANTLY WITH SPACE-BASED ASSETS. THEREFORE, FUTURE SPACE SYSTEMS MUST MEET OPERATIONAL REQUIREMENTS IF THEY ARE TO FUNCTION AS ELEMENTS OF OUR OVERALL DETERRENT POSTURE. SECOND, FREE ACCESS TO SPACE FOR ALL NATIONS IS AS CRITICAL AS FREE ACCESS TO THE EARTH'S OCEANS. THIRD, IMPROVED DEFENSIVE CAPABILITIES TO DETER ENEMY AGGRESSION OR, IF NECESSARY, TO DEFEND CRITICAL MILITARY SPACE SYSTEMS MUST BE DEVELOPED. WE CLEARLY LACK THAT IN OUR UNITED STATES SPACE FORCE TODAY. FINALLY, THE U.S. WILL CONTINUE TO IMPROVE THOSE SPACE SYSTEMS THAT DIRECTLY SUPPORT MILITARY FORCES.

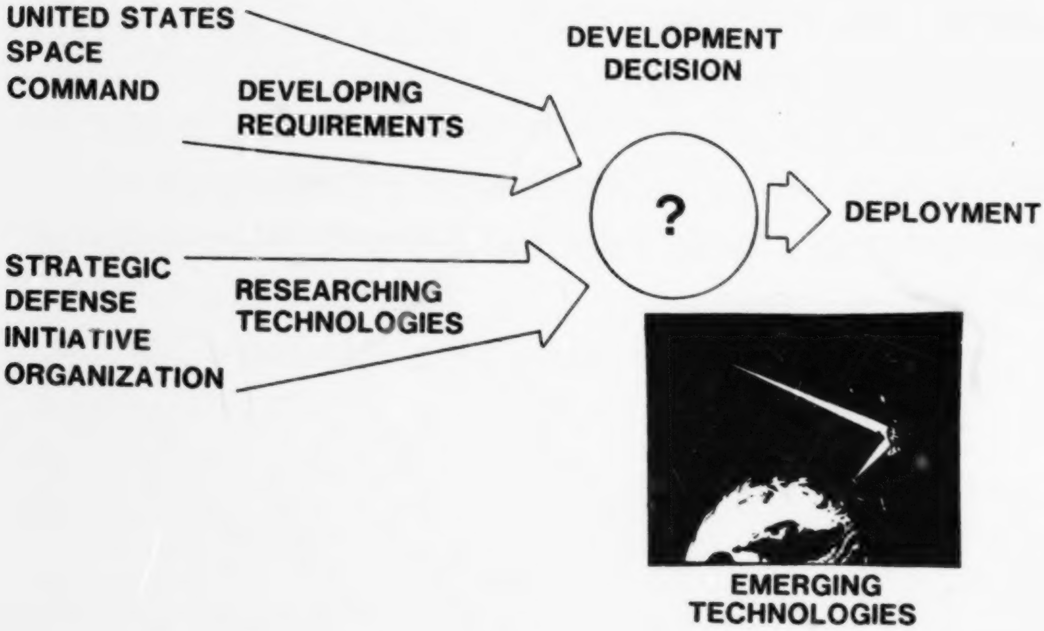
THERE IS NOTHING SINISTER ABOUT A NATION'S DESIRE TO ENHANCE ITS SECURITY AND PROTECT ITS PEOPLE BY USING THE UNIQUE QUALITIES OF SPACE. TO BELIEVE OTHERWISE WOULD BE SIMILAR TO OBJECTING TO THE USE OF THE SEAS, THE AIR, OR THE LAND ITSELF TO STRENGTHEN OUR DETERRENT POSTURE; AND OUR WARFIGHTING CAPABILITY SHOULD DETERRENCE FAIL. THE MILITARY MISSIONS PERFORMED IN SPACE CLEARLY ENHANCE U.S. AND ALLIED DETERRENT CAPABILITIES, AND OUR ABILITY TO PREVAIL IN A CONFLICT.

MILITARY SPACE MISSIONS

- SPACE OPERATIONS
  - SPACE SUPPORT
  - SPACE CONTROL
- BALLISTIC MISSILE DEFENSE
  - PLANNING
  - REQUIREMENTS DEVELOPMENT

KEY MILITARY SPACE MISSIONS ARE SPACE SUPPORT AND SPACE CONTROL. IN ADDITION, BALLISTIC MISSILE DEFENSE----SHOULD THE U.S. FIELD SUCH A SYSTEM----WILL ALSO BE PARTIALLY PERFORMED BY SPACE-BASED ASSETS. I AM OPTIMISTIC----OR AT LEAST HOPEFUL----THAT OUR NATION WILL TAKE THE DECISION TO DEPLOY A MISSILE DEFENSE . . . I BELIEVE IT'S THE "RIGHT" THING TO DO AND OPENS THE DOOR TO A NEW ERA IN OUR SECURITY. SO I'D LIKE TO OPEN WITH SOME BRIEF COMMENTS ON BALLISTIC MISSILE DEFENSE----TRULY A POTENTIAL MISSION OF THE "NEW DIMENSION."

BALLISTIC MISSILE DEFENSE



UNITED STATES SPACE COMMAND

DEVELOPING REQUIREMENTS

DEVELOPMENT DECISION

?

DEPLOYMENT

STRATEGIC DEFENSE INITIATIVE ORGANIZATION

RESEARCHING TECHNOLOGIES

EMERGING TECHNOLOGIES

THE CURRENT ROLE OF THE U.S. SPACE COMMAND IN BALLISTIC MISSILE DEFENSE IS TO DEVELOP OPERATIONAL REQUIREMENTS FOR THE SYSTEM. WHILE THE STRATEGIC DEFENSE INITIATIVE ORGANIZATION, OR SDIO, IS RESEARCHING TECHNOLOGIES, THE U.S. SPACE COMMAND IS PROVIDING THE ESSENTIAL OPERATIONAL PERSPECTIVES THROUGH A BALLISTIC MISSILE DEFENSE CONCEPT OF OPERATIONS. WE'VE WRITTEN SUCH A CONCEPT THAT IS CURRENTLY BEING STAFFED BY THE JOINT CHIEFS OF STAFF.

SDIO'S WORK TO DATE, HAS BEEN ASTOUNDING----TECHNICAL BREAKTHROUGHS HAVE BEEN ACHIEVED FAR MORE RAPIDLY THAN EXPECTED DESPITE WHAT YOU READ IN THE PRESS. THESE BREAKTHROUGHS HOLD THE POTENTIAL TO PROVIDE IMPORTANT AND EFFECTIVE DEFENSES AGAINST BALLISTIC MISSILES AND WILL ENSURE NOT ONLY A BETTER FUTURE----BUT A FUTURE PERIOD.

A BALLISTIC MISSILE DEFENSE SYSTEM WOULD FORTIFY DETERRENCE----IT WOULD BUILD A DETERRENCE BASED ON BOTH OFFENSE AND DEFENSE RATHER THAN THE THREAT OF RETALIATION ALONE.

CLEARLY, CAPITALIZING ON THE UNIQUE QUALITIES OF SPACE, TO FREE THE WORLD FROM THE SWORD OF DAMOCLES CALLED BALLISTIC MISSILES, IS SOMETHING THAT MUST BE RESEARCHED, EVALUATED, DISCUSSED, AND HOPEFULLY FIELDED. BUT WHILE THIS IS AN INTRIGUING OPTION FOR THE FUTURE, MILITARY SPACE OPERATIONS----THE PRIMARY MISSION IN SPACE----IS AND WILL CONTINUE TO BE A VITAL ELEMENT IN THE CONDUCT OF MILITARY OPERATIONS ON LAND, AT SEA, AND IN THE AIR.

MILITARY SPACE OPERATIONS

OPERATIONAL IMPERATIVES

- ENHANCE CAPABILITIES OF CINCS
  - PROVIDE TIMELY AND RELIABLE SUPPORT TO TERRESTRIAL FORCES
  - DEFEND OUR SPACE FORCES
  - ASSURE MISSION CAPABILITY
- CONTROL SPACE
  - NEGATE HOSTILE SPACE FORCES IF DIRECTED

IN MY VIEW, SPACE SYSTEMS HAVE ONE PURPOSE, I SAID IT BEFORE AND I'LL SAY IT AGAIN----TO SUPPORT MILITARY FORCES AND THEIR OPERATIONS HERE ON EARTH.

SPACE IS CRITICAL TO TERRESTRIAL MILITARY OPERATIONS. THIS CRITICALITY HAS LED US TO A SET OF OPERATIONAL IMPERATIVES REGARDING SPACE SUPPORT AND SPACE CONTROL. MILITARY SPACE OPERATIONS MUST ENHANCE THE CAPABILITIES OF THE TERRESTRIAL WARFIGHTERS AND PREVENT THE ENEMY FROM GAINING THE ADVANTAGES AFFORDED BY HIS USE OF SPACE.

WE MUST ASSURE THAT THOSE THINGS DONE IN SPACE CAN BE COUNTED ON DURING A CONFLICT. TO ACHIEVE THIS, WE MUST ALSO BE ABLE TO CONTROL SPACE----AS DICTATED BY NATIONAL SECURITY CONDITIONS----IN SUPPORT OF BOTH U.S. AND ALLIED INTERESTS.

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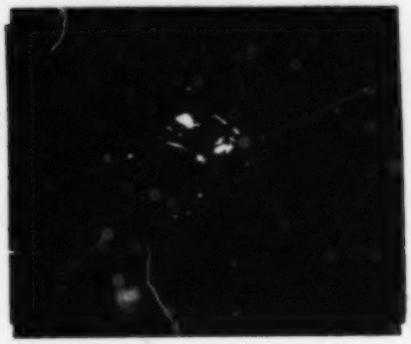
MILITARY FORCE ENHANCEMENT

- COMMUNICATIONS
  - 70 PERCENT OF TRANSOCEANIC TRAFFIC
  - GLOBAL, HIGH-SPEED, SECURE CONNECTIVITY
- NAVIGATION
  - GLOBAL, ALL WEATHER, REAL TIME POSITIONING
- SURVEILLANCE
  - WEATHER, SEA STATE, MAPPING
  - WARNING

EVEN THOUGH WE'VE BEEN IN SPACE FOR 30 YEARS, IN FACT THE SPUTNIK WAS LAUNCHED ON 4 OCTOBER 1957 SO WE'VE JUST PASSED THAT 30TH ANNIVERSARY, OUR ABILITY TO EXPLOIT THE ADVANTAGES OF SPACE IS STILL IN ITS INFANCY, AND AS WE BECOME MORE FAMILIAR WITH THE ENVIRONMENT I'M CONVINCED WE WILL DEVELOP NEW CAPABILITIES. BUT CLEARLY SOME FUNCTIONS HAVE ALREADY EMERGED AS BEST CONDUCTED FROM SPACE. THESE INCLUDE COMMUNICATION, NAVIGATION, AND SURVEILLANCE. THESE FUNCTIONS GREATLY ENHANCE THE CAPABILITIES OF MILITARY FORCES AND ALLOW FOR THE EFFECTIVE APPLICATION OF MILITARY POWER, ANYWHERE IN THE WORLD. I'LL DISCUSS BRIEFLY EACH FUNCTION, BEGINNING WITH COMMUNICATIONS.

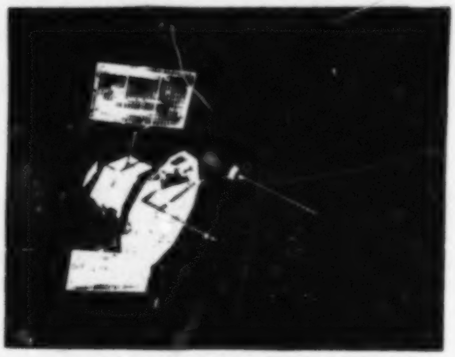
COMMUNICATION SATELLITE SYSTEMS

DEFENSE SATELLITE COMMUNICATIONS SYSTEM



- SUPER-HIGH FREQUENCY
- 1,300 VOICE AND DATA CIRCUITS
- GEOSYNCHRONOUS ORBIT

FLEET SATELLITE COMMUNICATIONS SYSTEM



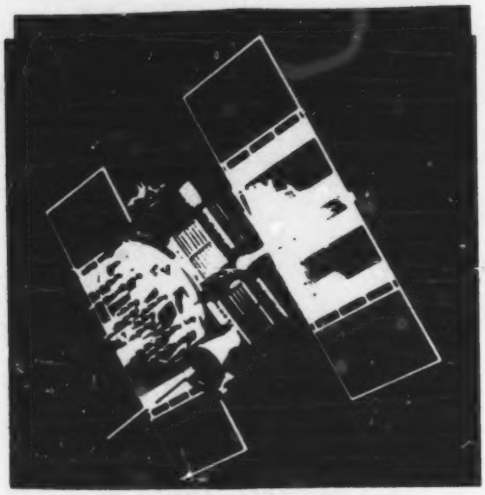
- ULTRA-HIGH FREQUENCY
- 100 VOICE AND DATA CIRCUITS
- GEOSYNCHRONOUS ORBIT

THE EFFECTIVE EMPLOYMENT OF TERRESTRIAL FORCES OPERATING OVER LARGE DISTANCES, EVEN SMALL DISTANCES WHEN JAMMING EXISTS, DEMANDS INSTANTANEOUS, SECURE COMMUNICATIONS. TODAY COMMUNICATIONS LIKE THE DEFENSE SATELLITE COMMUNICATIONS SYSTEM AND THE FLEET SATELLITE COMMUNICATIONS SYSTEM HANDLE OVER 70 PERCENT OF ALL UNITED STATES MILITARY LONG-HAUL REQUIREMENTS. HOWEVER, WE KNOW THESE SYSTEMS WILL BE SEVERELY STRESSED DURING A CRISIS OR CONFLICT!

OUR FUTURE COMMUNICATIONS SATELLITES, THE UHF FOLLOW-ON SYSTEM AND THE MILSTAR EHF SYSTEM WILL SOON SERVE U.S. WORLDWIDE MILITARY FORCES. MILSTAR'S ADVANCED TECHNOLOGY WILL PROVIDE ANTIJAM, SURVIVABLE, SECURE COMMUNICATIONS THROUGH ALL LEVELS OF CONFLICT. IT WILL PROVIDE AIR, GROUND, AND SEA FORCES WITH THE ASSURED COMMUNICATIONS NECESSARY TO SUPPORT THE EXECUTION, OF BOTH STRATEGIC AND TACTICAL MILITARY OPERATIONS. AS WE LOOK TO THE BUILDING AND DEPLOYMENT OF THESE SYSTEMS, IT'S CLEAR THAT WHEN WE ARE UNDER SEVERE JAMMING THAT THE DATA RATE OF THESE SATELLITES WILL BE REDUCED. IT'S IMPORTANT THAT ALL OF US THAT USE THIS INFORMATION AND WORK HARD TO REDUCE THE SIZE OF THE MESSAGES, FORMAT AND CONTENT OF THOSE MESSAGES, SO THAT VITAL INFORMATION CAN GET THROUGH. WE'RE WORKING ON THAT AT MY HEADQUARTERS AND IT'S SOMETHING THAT NATO HAS TO COME FORWARD WITH AS WELL.

I THINK WE ALL AGREE THAT COMMUNICATIONS ARE VITALLY IMPORTANT TO THE COMMAND AND CONTROL OF MILITARY FORCES, BUT PRECISE NAVIGATION IS ALSO NECESSARY IF WE ARE TO PUT BOMBS AND OTHER ORDNANCE PRECISELY AND DIRECTLY ON THE RIGHT TARGET, DAY, NIGHT, AND ALL WEATHER.

NAVSTAR GLOBAL POSITIONING SYSTEM

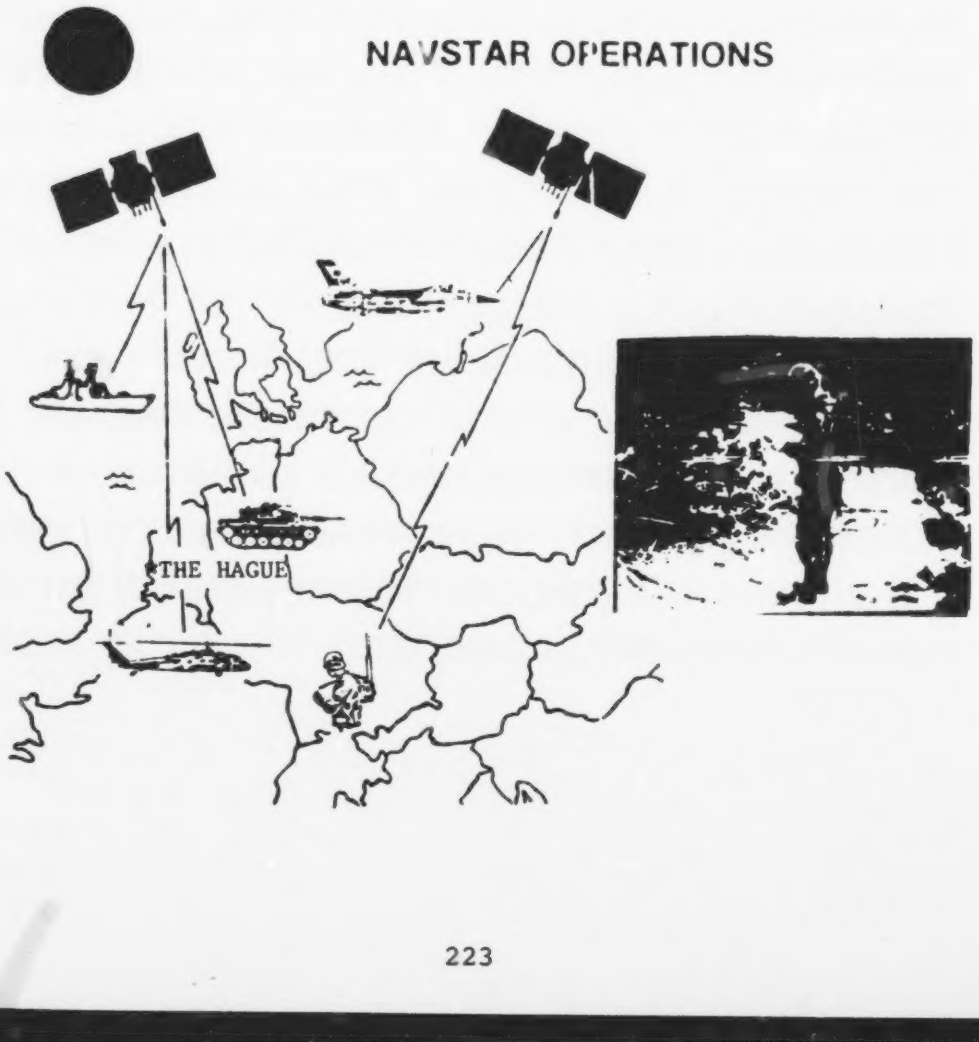


NAVSTAR GPS

- PRECISE POSITION, VELOCITY AND TIME DATA
- WORLDWIDE, CONTINUOUS, ALL-WEATHER COVERAGE
- 10 NATO SUBSCRIBERS
- 21 OPERATIONAL SATELLITES
- PASSIVE AND JAM-RESISTANT

NAVIGATION IS BEING REVOLUTIONIZED BY THE DEPLOYMENT OF A HIGH PERFORMANCE SPACE-BASED MULTIPLE-SATELLITE RADIO NAVIGATION SYSTEM. THIS SYSTEM----THE NAVSTAR GLOBAL POSITIONING SYSTEM----WILL PROVIDE SYNCHRONIZED TIMING, POSITION, AND VELOCITY DATA ACCURATE TO 16 METERS OR LESS. TACTICAL USES OF NAVSTAR WILL INCLUDE PINPOINTING TROOP ASSEMBLY POINTS; COORDINATING ARTILLERY AND AIR STRIKES; STATION KEEPING; AND COORDINATING SEARCH AND RESCUE OPERATIONS TO NAME JUST A FEW. IT'S IMPACT ON PRECISION-GUIDED MUNITIONS, LOW-INTENSITY CONFLICT OPERATIONS, AND LONG-RANGE TARGET PLANNING IS ONLY NOW BEING FULLY APPRECIATED.

CURRENTLY SEVEN DEVELOPMENTAL NAVSTAR SATELLITES ARE DEPLOYED. THE FIRST LAUNCH OF AN OPERATIONAL SATELLITE IS SCHEDULED FOR THIS WINTER. THE FINAL CONSTELLATION WILL CONTAIN TWENTY-ONE OPERATIONAL SATELLITES AND THREE ON-ORBIT SPARES AND RESERVES. EVEN WITH THE LIMITED CAPABILITY THAT EXISTS TODAY, THE SYSTEM IS ALREADY DEMONSTRATING ITS UTILITY TO MILITARY COMMANDERS----WE ARE EXTREMELY EXCITED ABOUT ITS FULL CAPABILITIES.



NAVSTAR OPERATIONS

NAVSTAR, FOR EXAMPLE, HAS ALREADY IMPROVED BOMBING ACCURACY SIGNIFICANTLY AND I'M SURE I DON'T NEED TO EXPLAIN THE IMPORTANCE OF THIS TO YOU. NAVSTAR WAS RECENTLY EMPLOYED IN THE PERSIAN GULF TO PINPOINT POSITIONS IN MINESWEEPING OPERATIONS, THEREBY ENSURING SAFE PASSAGE OF BOTH MILITARY AND COMMERCIAL VESSELS.

AS YOU CAN WELL UNDERSTAND, THE SHIP THAT'S DOING MINE SWEEP LAYS OUT A PRECISE COURSE TO SWEEP, AND THEN IT MUST FOLLOW THAT COURSE. WITH THE NORMAL COMMUNICATIONS OR NAVIGATIONAL SYSTEMS AVAILABLE, QUITE OFTEN THE SHIP HAS TO SWEEP OVER AND OVER AGAIN TO ENSURE THAT THEY'VE ACCURATELY AND THOROUGHLY SWEPT THE WATERS. WITH THE GLOBAL POSITIONING SYSTEM, THEY WERE ABLE TO PRECISELY FOLLOW THE COURSE THEY SET. AS A RESULT, THEY WERE ABLE TO SWEEP FAR FASTER AND MORE EFFICIENTLY THAN IN THE PAST.

YOUR MINE HUNTER IN THE PERSIAN GULF----THE URK----HAS NO DOUBT EXPERIENCED THE ADVANTAGES OF NAVSTAR. AND YOU HAVE ANOTHER SHIP----THE PIEDEMAN----THAT HAS A NAVSTAR RECEIVER ON BOARD AS IT WORKS IN THE CARIBBEAN, I'M SURE NAVSTAR IS ENHANCING HER CAPABILITIES.

NAVSTAR WAS ALSO USED IN A RECENT BRIGHT STAR EXERCISE BY GROUND AND AIR FORCES TO ACCURATELY RENDEZVOUS AFTER CROSSING BROAD EXPANSES OF DESERT TERRITORY. NAVIGATION AND COMMUNICATIONS ARE CLEARLY OPTIMIZED BY EMPLOYING SPACE SYSTEMS----SO IS SURVEILLANCE.

TODAY, MILITARY SPACE OPERATIONS PERFORM SURVEILLANCE AND WARNING FUNCTIONS TO SUPPORT UNITED STATES AND ALLIED FORCES. OUR ABILITY TO WARN COMMANDERS IN THE FIELD OF POTENTIAL EXPOSURE TO SOVIET SURVEILLANCE SATELLITES IS ESSENTIAL TO FORCE MANAGEMENT AND TACTICAL OPERATIONS IN SUPPORT OF OUR FORWARD-DEPLOYED STRATEGY. MISSILE AND SPACE WARNING SYSTEMS ALSO STAND READY TO WARN OF BALLISTIC MISSILE ATTACKS, AND ATTACKS AGAINST SPACE-BASED ASSETS. THE CURRENT MISSILE WARNING SYSTEM IS VIRTUALLY FAIL PROOF IN PROVIDING WARNING OF AN ICBM OR SLBM ATTACK AGAINST THE U.S. AND OUR ALLIES.

IT'S A SYSTEM THAT'S WELL TESTED. LAST YEAR THERE WERE NEARLY 600 BALLISTIC MISSILES AND SPACE SYSTEMS LAUNCHED THROUGHOUT THE WORLD. THE SYSTEM OF INFRARED DETECTORS IN SPACE AND TERRESTRIAL-BASED RADAR WERE CAPABLE OF DETECTING AND TRACKING ALL OF

THOSE. IN FACT I MIGHT SAY, THAT THE SOVIETS DO A GREAT JOB OF KEEPING OUR OPERATORS TRAINED AT WORK. WE SEE VIRTUALLY TWO EVERY DAY----SOMETIMES A PAINFUL PROCESS, BECAUSE I GET CALLED ON ALL OF THEM.

FUTURE SYSTEMS, SUCH AS THE BOOST SURVEILLANCE AND TRACKING SYSTEM CURRENTLY IN RESEARCH AND DEVELOPMENT AS PART OF THE BALLISTIC MISSILE DEFENSE EFFORT, WILL ENHANCE OUR ABILITY TO PROVIDE NEAR REAL-TIME DETECTION, TRACKING, AND IDENTIFICATION INFORMATION ON ICBM, SLBM, AND TACTICAL BALLISTIC MISSILE LAUNCHES ANYWHERE IN THE WORLD, FASTER AND WITH MORE PRECISION. ENVIRONMENTAL SURVEILLANCE IS ALSO AN IMPORTANT PART OF SPACE SUPPORT.

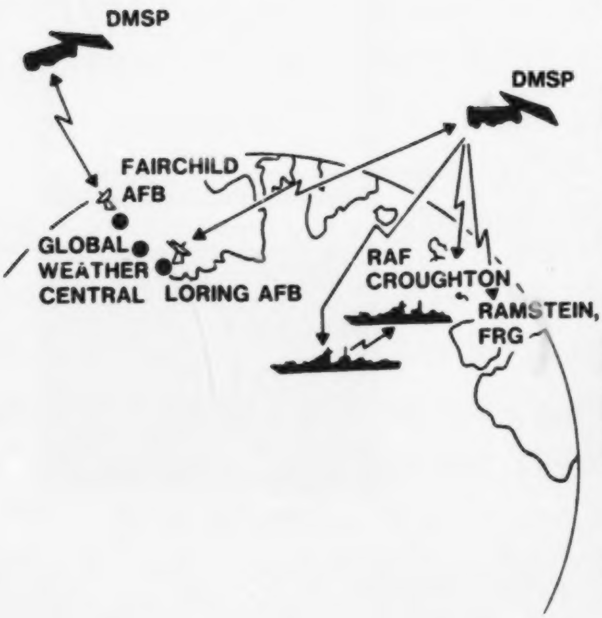
DEFENSE METEOROLOGICAL SATELLITE PROGRAM

DMSP

- SPACE BASED WEATHER SURVEILLANCE SYSTEM
  - TWO SATELLITES IN POLAR ORBIT
  - GLOBAL COVERAGE FOUR TIMES EACH DAY
  - .3 NAUTICAL MILE RESOLUTION
  - NEAR 100% RELIABILITY
- DIRECT DOWNLINK TO TACTICAL FORCES

TODAY BOTH THE CIVILIAN AND THE MILITARY COMMUNITIES HAVE COME TO DEPEND ON WEATHER SURVEILLANCE PROVIDED BY SPACE SYSTEMS. EXISTING ENVIRONMENTAL SATELLITES PROVIDE EXCELLENT WEATHER SUPPORT ON A TIMELY BASIS. JUST RECENTLY, THE DEFENSE METEOROLOGICAL SATELLITE PROGRAM PROVIDED TIMELY AND ACCURATE TRACKING OF THE MOST DEVASTATING HURRICANE EVER RECORDED RESULTING IN THE SAVING OF HUNDREDS, PERHAPS THOUSANDS, OF LIVES. OUR FLEETS ROUTINELY USE SPACE-BASED WEATHER SATELLITES TO AVOID SUCH ENVIRONMENTAL HAZARDS.

DEFENSE METEOROLOGICAL SATELLITE OPERATIONS


DMSP
DMSP
FAIRCHILD AFB
GLOBAL WEATHER CENTRAL
LORING AFB
RAF CROUGHTON
RAMSTEIN, FRG

THE HAGUE

THE CURRENT DEFENSE METEOROLOGICAL SATELLITE PROGRAM----A TWO-SATELLITE CONSTELLATION----MUST BE AUGMENTED TODAY BY CIVIL SYSTEMS. IT IS MY PERSONAL HOPE AND, IN FACT, ONE OF OUR COMMITMENTS FOR THE FUTURE, THAT WE CAN INCREASE THE NUMBER OF MILITARY WEATHER SATELLITES TO PROVIDE THE COMMANDERS IN THE FIELD WITH EVEN BETTER PICTURES OF THE ENVIRONMENTAL CONDITIONS AHEAD OF THEIR FORCES OR ON THEIR FLANK, OR IN THEIR THEIR LOCAL AREAS.

MULTISPECTRAL IMAGERY

- MILITARY APPLICATIONS
  - CHANGE DETECTION
  - TARGET PERSPECTIVE VIEWS
  - TRAFFICABILITY ANALYSIS
  - SHALLOW WATER BATHYMETRY
  - CAMOUFLAGE DETECTION
- MULTISPECTRAL SYSTEMS ON-ORBIT
  - LANDSAT-UNITED STATES
  - SPOT-FRANCE
  - MOS-1-JAPAN
  - METEOR PRIORADA-USSR
- USSPACECOM MROC (2-88)
  - SUBMITTED TO JCS FOR VALIDATION MAY 88

TERRAIN MAP

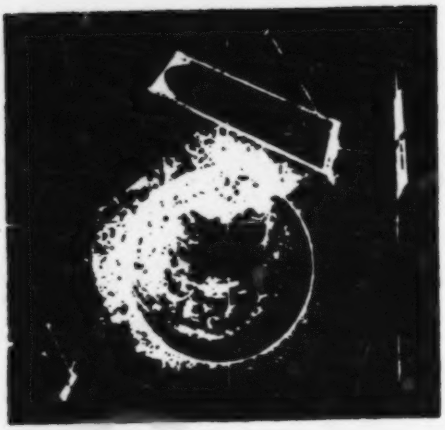
LANDSAT PHOTO

WE ARE ALSO BEGINNING TO APPLY THE ENORMOUS POTENTIAL OF MULTISPECTRAL IMAGERY TO MILITARY OPERATIONS. IMAGINE THE IMPACT OF KNOWING THE DEPTH OF THE WATER, THE SOIL TYPE, AND THE LOCATION OF CAMOUFLAGED ENEMY POSITIONS BEFORE THE AMPHIBIOUS LANDING BEGINS OR BE ABLE TO LOCATE RELOCATABLE STRATEGIC TARGETS BY THE USE OF MULTISPECTRAL IMAGES. THE FORCES GOING ASHORE WILL CERTAINLY BE BETTER INFORMED TO DO COMBAT.

TODAY THE MILITARY DEPENDS ON COMMERCIAL ASSETS FOR MULTISPECTRAL IMAGERY. WE HAVE PREPARED MULTISERVICE OPERATIONAL REQUIREMENTS IN HOPE THAT THE "NEW DIMENSION" WILL INCLUDE MILITARY MULTISPECTRAL IMAGERY SYSTEMS. SYSTEMS THAT CAN REPORT DIRECTLY TO FIELD COMMANDERS. MILITARY SYSTEMS WILL BE MORE RESPONSIVE, AND WITHOUT QUESTION, ENHANCE OUR MILITARY CAPABILITIES.

SURVEILLANCE SYSTEMS, AS YOU WELL KNOW, ARE CRITICAL TO ALL MILITARY OPERATIONS AND WILL CERTAINLY IMPROVE AS WE MOVE INTO THE 21ST CENTURY. IN FACT, SUCH AN IMPROVEMENT IS ALREADY UNDER CONSIDERATION. THIS NEW SYSTEM----A SPACE-BASED RADAR----WILL REVOLUTIONIZE TERRESTRIAL MILITARY OPERATIONS.

SPACE BASED RADAR

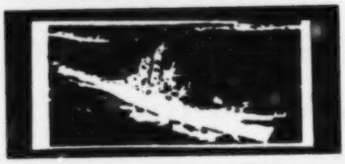


OBJECTIVE

INCREASED SURVEILLANCE
FOR DETERRENT AND
WARFIGHTING COMMANDERS

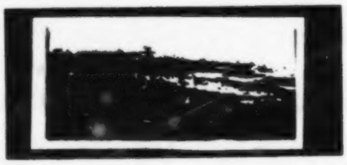
THE OBJECTIVE OF THE CURRENT WORK ON SPACE-BASED RADAR IS TO INVESTIGATE ITS POTENTIAL POSSIBILITIES FOR IMPROVING SUPPORT TO MILITARY COMMANDERS. IT HAS BEEN SAID, THAT A SPACE-BASED RADAR WOULD MAKE THE WORLD A FISHBOWL. I BELIEVE IT WILL. AS PRESENTLY ENVISIONED, THAT'S WHAT WE'RE LOOKING FOR.

POTENTIAL SPACE-BASED RADAR CAPABILITIES



- CONTINUOUS SURVEILLANCE AT ALL ALTITUDES
- DETECT AND TRACK IN ALL WEATHER CONDITIONS
- SHIP CLASSIFICATION

- SURVIVABLE AS THE FORCES SUPPORTED
- NEAR REAL-TIME DATA TO OPERATIONAL USERS



A FULL SPACE-BASED RADAR CONSTELLATION COULD PROVIDE CONTINUOUS, GLOBAL, NEAR REAL-TIME, ALL-WEATHER COVERAGE. IT WOULD BE ABLE TO DETECT AND TRACK FIGHTER-SIZED AIRCRAFT FROM THEIR POINT OF ORIGIN, AND DETECT, TRACK, AND CLASSIFY SHIPS AT SEA.

THE SYSTEM IS ALSO BEING DESIGNED TO BE AS SURVIVABLE AS THE FORCES IT SUPPORTS----A CHARACTERISTIC WE SHOULD DEMAND FOR ALL SPACE-BASED SYSTEMS THAT SUPPORT MILITARY OPERATIONS.

THE ABILITY TO CONTINUOUSLY AND ACCURATELY TRACK ATMOSPHERIC THREATS FROM THEIR POINTS OF ORIGIN WOULD HAVE AN INCREDIBLE IMPACT ON TOMORROW'S TACTICAL OPERATIONS. BECAUSE THE SYSTEM COULD PROVIDE INFORMATION DIRECTLY TO THE COMMANDERS, DELAYS CAUSED BY THE PROCESSING AND RELAY OF DATA BY INTERMEDIATE GROUND STATIONS BACK IN THE UNITED STATES WOULD BE ELIMINATED.

A SPACE-BASED RADAR WOULD VIRTUALLY ELIMINATE THE HORIZON----ALLOWING COMMANDERS TO SEE ALL OF THE THREATS TO HIS FORCES AND ACCURATELY ASSESS THE PROPER AXIS AND THE STRENGTH OF THOSE THREATS. IN FACT, WHAT WE'RE LOOKING FOR IS THE GLOBAL PERSPECTIVE. THERE WILL BE FEWER UNKNOWNS AND COMMANDERS WILL BE ABLE TO EMPLOY THEIR FORCES AT THE RIGHT PLACE, AT THE RIGHT TIME, AND IN THE RIGHT COMBINATION.

COMMUNICATIONS, NAVIGATION, AND SURVEILLANCE FROM SPACE ARE CENTRAL TO THE SPACE SUPPORT ASPECT OF MILITARY SPACE OPERATIONS. SPACE CONTROL, THE OTHER SIDE OF THE MILITARY SPACE OPERATIONS COIN, ALSO PLAYS A SIGNIFICANT ROLE IN THE NEW DIMENSION.

SPACE CONTROL HAS NOT RECEIVED MUCH ATTENTION IN THE FREE WORLD----THAT IS NOT THE CASE IN THE SOVIET UNION. TODAY, ONLY THEY CAN CONTROL SPACE----THREATEN U.S. AND ALLIED TERRESTRIAL FORCES AND ATTACK CRITICAL U.S. AND ALLIED SATELLITES.

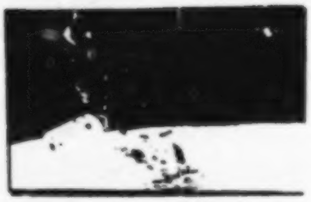
SOVIET SPACE PROGRAM

- SPACE EFFORT FOCUSED ON SUPPORT OF TERRESTRIAL COMBAT OPERATIONS
- BUILDING A LAUNCH CAPABILITY THAT EXCEEDS PROJECTED REQUIREMENTS
- MAINTAIN AND DEVELOP "SPECIAL SPACECRAFT TO DESTROY SPACE SYSTEMS USED BY THE ENEMY"

LIKE THE UNITED STATES, THE SOVIETS HAVE CLEARLY DEVELOPED SPACE CAPABILITIES DESIGNED TO SUPPORT MILITARY REQUIREMENTS. BUT UNLIKE THE UNITED STATES, THEY ALSO HAVE THE CAPABILITY TO DESTROY ALLIED SPACECRAFT. THE SOVIETS HAVE ALSO BUILT LAUNCH CAPABILITIES THAT FAR EXCEED ALL ESTIMATES OF THEIR PROJECTED REQUIREMENTS----A WORRISOME SITUATION. TO SAY THE LEAST.

IN FACT, IT'S WRITTEN IN THE MILITARY SOVIET POWER PUBLICATION, THAT THE SOVIETS HAVE A MILLION POUNDS OF EXCESS CAPABILITY. ONE HAS TO WONDER WHY A NATION THAT IS AGRICULTURALLY POOR, ECONOMICALLY POOR, INDUSTRIALLY POOR, AND JUST PLAIN POOR, IS WILLING TO INVEST BILLIONS OF DOLLARS IN THAT EXCESS CAPABILITY. ONE HAS TO BELIEVE THAT IT SERVES AN ULTERIOR PURPOSE.

SOVIET ASAT SYSTEMS



CO-ORBITAL 1972

- REPEATED USE OF COMPONENTS

GALOSH 1968

- RADARS TRACK SATELLITES

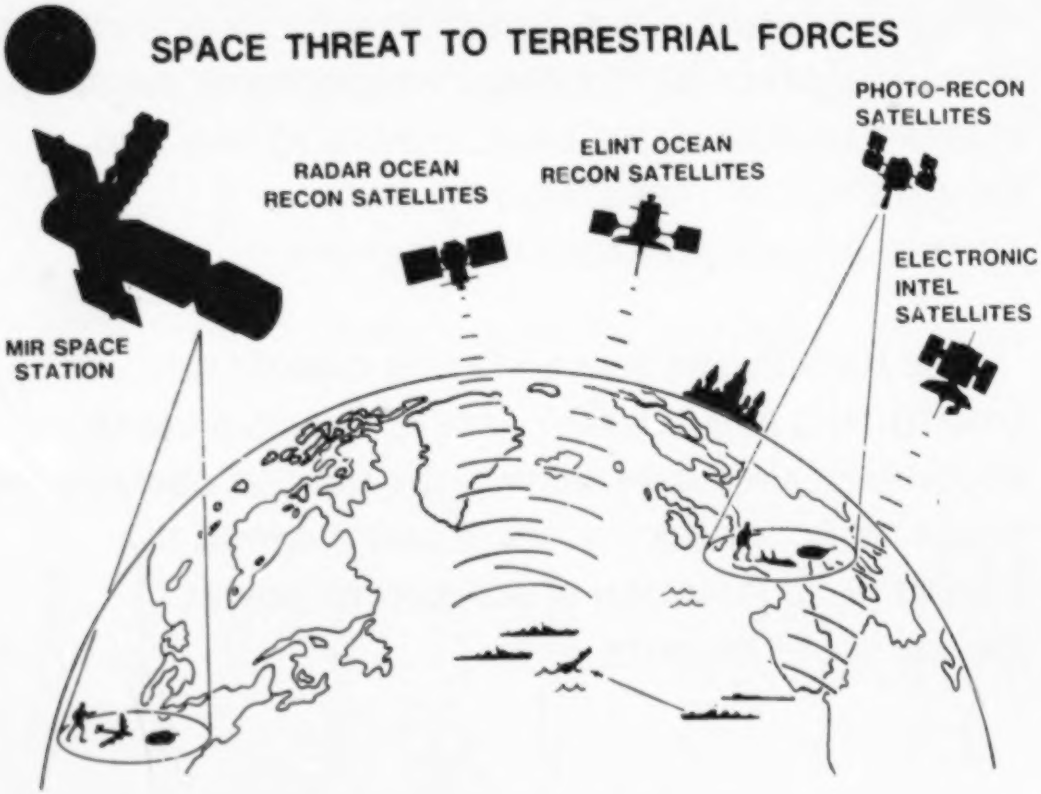
DIRECTED ENERGY

- R & D DEVICES AT SARY SHAGAN

ELECTRONIC COMBAT

- EMPLOYMENT COMPATIBLE WITH DOCTRINE

THE SOVIET UNION HAS A VARIETY OF WEAPONS USED TO CONTROL SPACE. THESE SYSTEMS ALLOW THE SOVIETS TO DESTROY SPACE SYSTEMS CRITICAL TO THE EMPLOYMENT OF NATO AND OTHER FREE WORLD FORCES. THE POTENTIAL OF THESE SOVIET SYSTEMS, RANGE FROM COMPLETE PHYSICAL DESTRUCTION TO SUBTLE DEGRADATION.



SPACE THREAT TO TERRESTRIAL FORCES

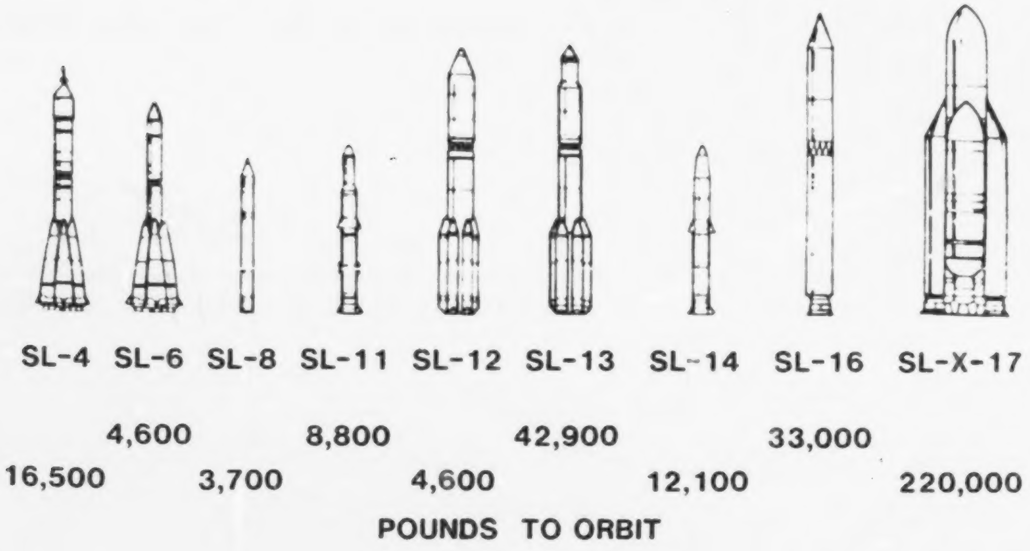
PHOTO-RECON SATELLITES
ELINT OCEAN RECON SATELLITES
RADAR OCEAN RECON SATELLITES
ELECTRONIC INTEL SATELLITES
MIR SPACE STATION

IN ADDITION TO THEIR SPACE CONTROL WEAPONS, THE SOVIETS EMPLOY A VARIETY OF SPACE SYSTEMS THAT CAN GREATLY IMPROVE THE EFFECTIVENESS OF THEIR MILITARY----THEREBY INCREASING THE THREAT TO ALLIED FORCES. THEY HAVE WRITTEN----AS WITH THE EVOLUTION OF AIR POWER, SPACE SUPERIORITY WILL BECOME A PREREQUISITE FOR GROUND SUPERIORITY. THEY ARE EXPANDING AND IMPROVING THEIR ALREADY MATURE SATELLITE RECONNAISSANCE PROGRAMS. EXAMPLES OF THESE RECONNAISSANCE SYSTEMS INCLUDE THE RADAR OCEAN RECONNAISSANCE SATELLITE AND THE ELINT OCEAN RECONNAISSANCE SATELLITES. AS YOU KNOW, THESE SYSTEMS LOCATE ALLIED NAVAL FORCES AT SEA, AND ENHANCE SOVIET TARGETING FOR THEIR BEYOND-THE-HORIZON ANTISHIP WEAPONS.

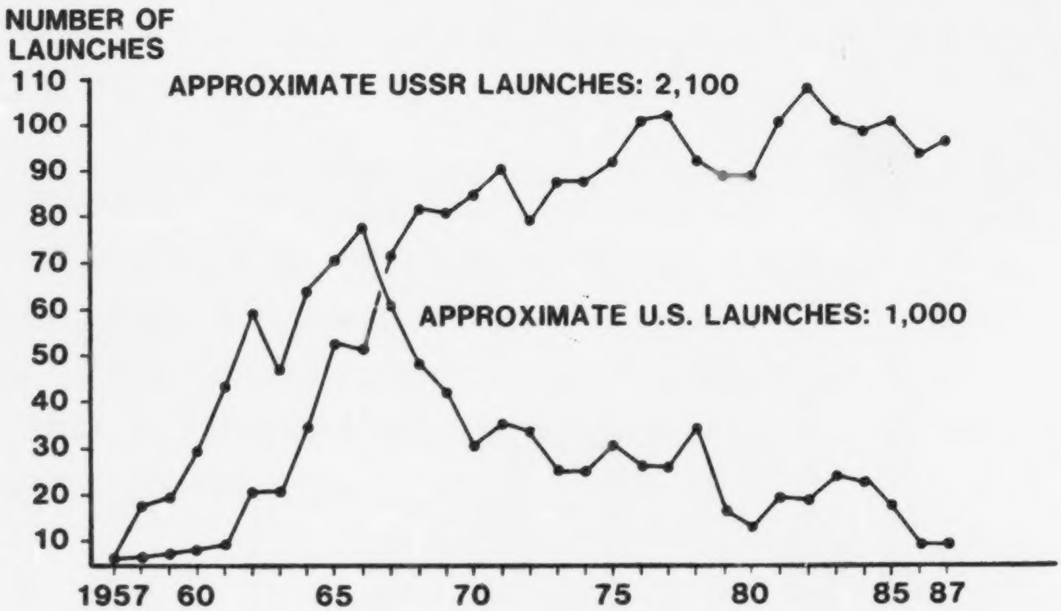
THE MANNED MIR SPACE STATION CANNOT BE OVERLOOKED AS A MILITARY ASSET. IT HAS A CLEAR RECONNAISSANCE CAPABILITY. IT CAN ALSO OBSERVE AND TRACK "NONCOOPERATIVE SPACECRAFT" GIVING IT A POTENTIAL TO FUNCTION IN SUPPORT OF SOVIET ANTISATELLITE EFFORTS.

JUST AS THE COUNTRIES OF THE FREE WORLD HAVE DEVELOPED AND DEPLOYED SURFACE TO AIR MISSILES TO COUNTER THE THREAT OF FIGHTER AIRCRAFT, AND SUBMARINES TO OFFSET THE POTENTIAL OF ENEMY NAVIES, WE MUST ALSO DEVELOP AND DEPLOY SUCH CAPABILITIES WITH REGARD TO SOVIET SPACE SYSTEMS. BUT THE SOVIETS' ABILITY TO ATTACK SATELLITES AND TO DEPLOY SYSTEMS THAT THREATEN U.S. AND ALLIED FORCES ARE NOT THE ONLY THREATENING ASPECTS OF THEIR SPACE CAPABILITIES. A VERY SIGNIFICANT MILITARY CAPABILITY----THOUGH SOMETIMES OVERLOOKED----IS THEIR ABILITY TO GO TO SPACE "ON DEMAND."

SOVIET BOOSTER SYSTEMS


SL-4 16,500
SL-6 4,600
SL-8 3,700
SL-11 8,800
SL-12 4,600
SL-13 42,900
SL-14 12,100
SL-16 33,000
SL-X-17 220,000
POUNDS TO ORBIT

THEY DO THAT WITH AN IMPRESSIVE ARRAY OF LAUNCH VEHICLES. TODAY, SOVIET LAUNCH CAPABILITIES INCLUDE EIGHT DIFFERENT OPERATIONAL BOOSTERS, WITH A NINTH SYSTEM----THE SL-X-17 (ENERGIA)----EXPECTED TO BE OPERATIONAL SOON. MANY OF THESE SYSTEMS HAVE BEEN IN USE SINCE THE 1960s AND HAVE DEMONSTRATED EXCELLENT RELIABILITY. FIVE OF THEIR BOOSTERS CAN LIFT OVER 10,000 POUNDS TO LOW-EARTH ORBIT.



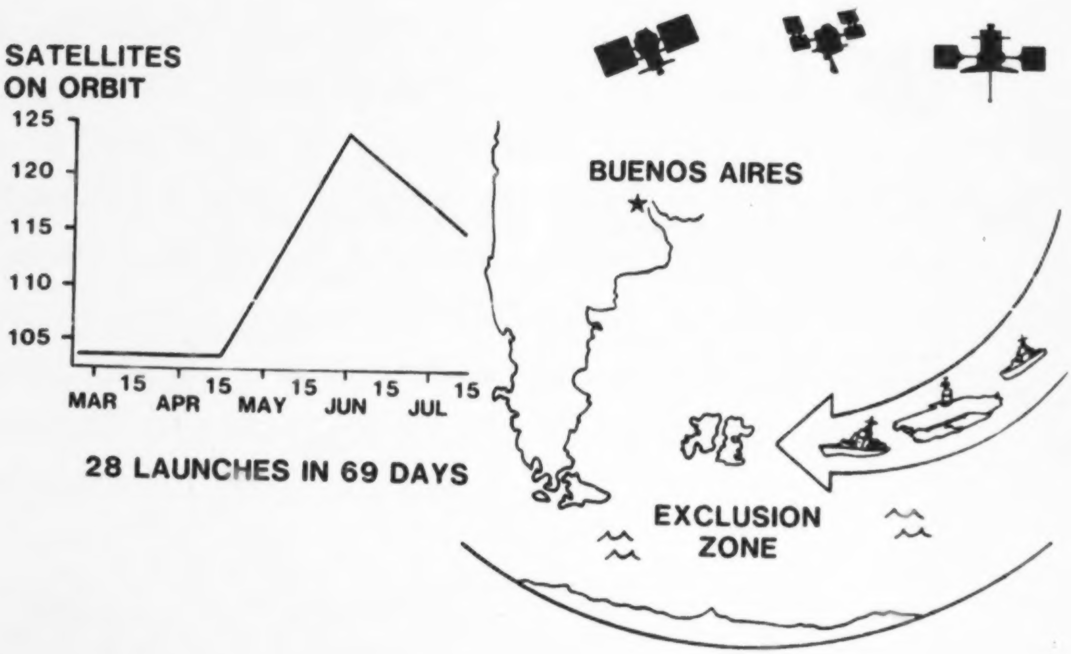
HISTORICAL SPACE LAUNCHES

THESE BOOSTERS GIVE THE SOVIETS THE ABILITY TO GO TO SPACE WHEN NECESSARY INSTEAD OF WHEN SCHEDULED----AND THEY CLEARLY DO THAT.

WHEREAS, THE SOVIETS CONDUCT ABOUT 100 SPACE LAUNCHES EACH YEAR----A TREND THAT HAS BEEN CONSISTENT THROUGHOUT MOST OF THIS DECADE. THE SOVIET ABILITY TO GO TO SPACE VIA THEIR ROBUST LAUNCH CAPABILITY, WAS DRIVEN HOME DURING THE FALKLANDS WAR.

SOVIET SURGE: THE FALKLAND WAR

2 APRIL - 14 JUNE 1982

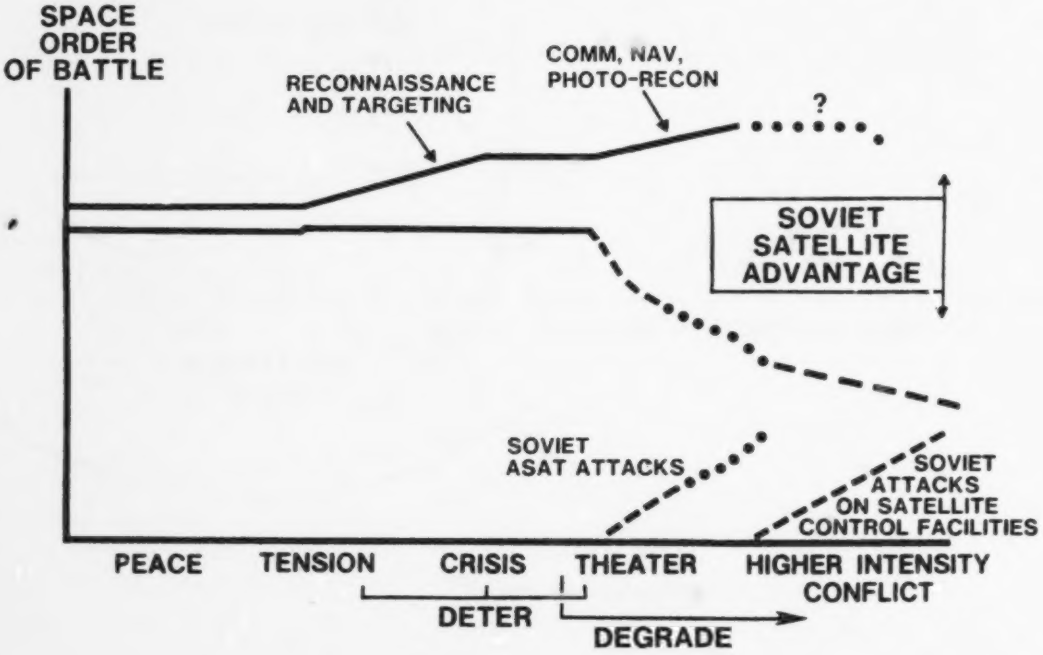


28 LAUNCHES IN 69 DAYS

DURING THAT CONFLICT, THE SOVIETS DEMONSTRATED A WARTIME SURGE CAPABILITY THAT IS WITHOUT EQUAL IN THE WORLD. FROM 2 APRIL 1982 TO 14 JUNE 1982, THEY LAUNCHED 28 TIMES. THEY CAN SURGE THEIR SPACE SYSTEMS "ON DEMAND" AND THEY CAN TAILOR THESE SYSTEMS TO SUPPORT SPECIFIC AREAS OF INTEREST. OF EQUAL INTEREST IS THE FACT THAT THE SOVIETS GREATLY INCREASED THEIR NUMBER OF SATELLITES ON ORBIT. THEY CURRENTLY MAINTAIN ABOUT 150 SATELLITES IN SPACE, MOST WITH MILITARY MISSIONS.

COMBINE THIS SOVIET SURGE CAPABILITY, A VARIETY OF ANTISATELLITE SYSTEMS, AND A DOCTRINE THAT DEMANDS CONTROL OF SPACE----THE OUTCOME, SHOULD DETERRENCE FAIL, COULD BE DETRIMENTAL TO U.S. AND ALLIED FORCES.

- POTENTIAL SPACE EMPLOYMENT OPTIONS



IN THIS REGARD, AT U.S. SPACE COMMAND, WE'VE LOOKED AT POTENTIAL SCENARIOS INVOLVING U.S. AND SOVIET SPACE FORCES. I'D LIKE TO SPEND A COUPLE OF MINUTES DISCUSSING OUR CONCERNS. AS DEPICTED IN THIS GRAPHIC, AS THE WORLD SITUATION MOVES FROM PEACE TO CRISIS, WE WOULD EXPECT THE SOVIETS TO INCREASE THEIR SPACE ORDER OF BATTLE----EXPANDING FIRST THEIR SURVEILLANCE AND TARGETING CAPABILITIES. SHOULD THE WORLD SITUATION DETERIORATE FURTHER, ONE WOULD ANTICIPATE SOVIET ATTACKS AGAINST ALLIED SPACECRAFT AND A FURTHER EXPANSION OF THEIR SPACE ORDER OF BATTLE. ALLIED SUPPORT DERIVED FROM SPACE COULD BE SEVERELY HANDICAPPED----THE BENEFITS OFFERED BY THE HIGH GROUND OF SPACE COULD ACCRUE IN FAVOR OF THE SOVIETS. WE COULD LOSE THE STRATEGIC LEVERAGE SPACE PROVIDES TO THE TERRESTRIAL BATTLES.

I DON'T BELIEVE THAT WE WILL WIN THE LAND, SEA, OR AIR BATTLE SIMPLY BY WINNING IN SPACE. BUT I DO BELIEVE, THAT IF WE ABDICATE CONTROL OF SPACE TO THE SOVIETS, AND CONTINUE TO ASSUME THAT SOVIET GOODWILL WILL ALLOW THE FREE WORLD TO USE SPACE, THEN WE WILL LOSE IN SPACE, AND AS A RESULT, MOST LIKELY LOSE THE TERRESTRIAL BATTLE AS WELL.

HAVING SAID THAT, AND HAVING JUST PRESENTED AN EVALUATION OF SOVIET CAPABILITIES THAT IS CLEARLY THREATENING TO THIS NEW DIMENSION: THE MILITARY APPLICATION OF SPACE----LET ME CLOSE WITH A REVIEW OF THE THINGS UNDER WAY IN THE UNITED STATES THAT WILL ENSURE THAT FREE WORLD SPACE MISSIONS WILL BE ACHIEVED.

IMPROVING OUR SPACE POSTURE

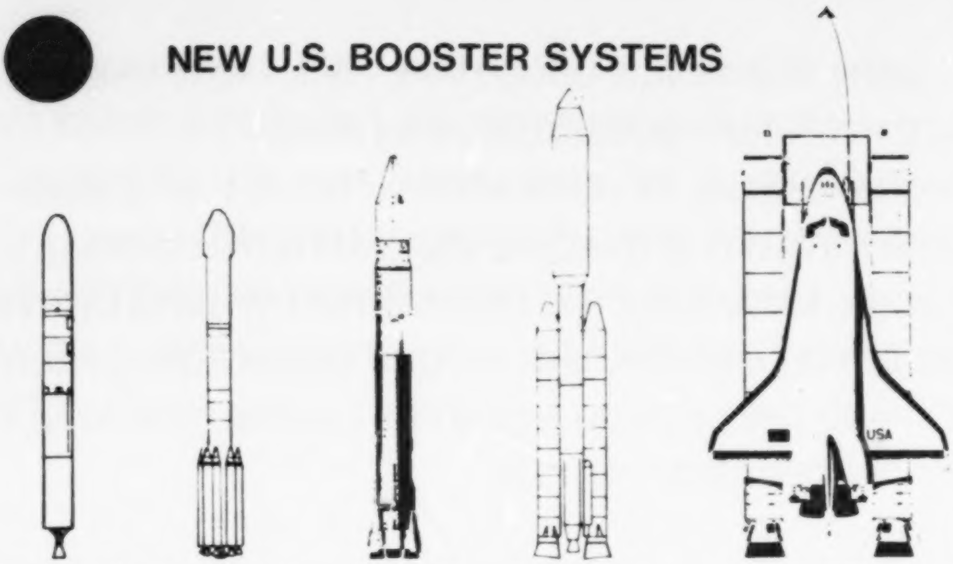
MILITARY COMSAT

- COMPRESS LAUNCH PREPARATION AND ON ORBIT CHECKOUT TIMES
- DEVELOP, AND DEPLOY SATELLITES TO MEET MILITARY NEEDS
- UPGRADE SATELLITE CONTROL NETWORK
- IMPROVE DATA DISTRIBUTION
- EDUCATE WARFIGHTERS

MANY THINGS ARE UNDER WAY TO IMPROVE THE U.S. SPACE POSTURE----ROBUSTING OUR LAUNCH RESPONSIVENESS, DEVELOPING SPACECRAFT WITH MORE MILITARY UTILITY, UPGRADING OUR SATELLITE CONTROL NETWORK, EXPANDING THE DISTRIBUTION OF DATA DERIVED FROM SPACE, AND BUILDING STRONG EDUCATIONAL PROGRAMS TO EXPAND THE UNDERSTANDING OF CAPABILITIES AVAILABLE FROM SPACE-BASED SYSTEMS.

WITH REGARD TO RESPONSIVE LAUNCH, WE HAVE A LONG WAY TO GO. TODAY U.S. SPACE LAUNCHES ARE DRIVEN "BY SCHEDULE" AND PLANNED MONTHS, IF NOT YEARS, IN ADVANCE. WHILE ACCEPTABLE IN PEACETIME, THIS SITUATION IS COMPLETELY UNACCEPTABLE FOR MILITARY OPERATIONS IN WAR. IF WE ANTICIPATE LOSSES AS THE RESULT OF SOVIET AGGRESSION----AND WE DO----THEN WE MUST DEVELOP SYSTEMS THAT ALLOW TIMELY REPLENISHMENT.

NEW U.S. BOOSTER SYSTEMS


TITAN II
4,200 *
DELTA II
8,870 *
ATLAS II
12,500 *
TITAN IV
38,700 *
SHUTTLE
42,000 *
USA

* POUNDS TO ORBIT

I AM HAPPY TO REPORT THAT THE U.S. IS DEVELOPING SUCH SYSTEMS THAT WILL GIVE US RESPONSIVE LAUNCH. LAST MONTH WE SUCCESSFULLY LAUNCHED THE NEW TITAN II SPACE LAUNCH VEHICLE ON ITS MAIDEN FLIGHT, AND WE ARE BACK IN SPACE WITH THE SHUTTLE. THESE NEW SYSTEMS, AND THOSE BEING DEVELOPED WILL HELP PROVIDE THE RESPONSIVE ACCESS TO SPACE SO VITAL TO SUPPORT MILITARY OPERATIONS.

MILITARY OPERATIONS WILL ALSO BE ENHANCED BY THE DEPLOYMENT OF NEW SYSTEMS, SUCH AS NAVSTAR, MILSTAR, AND POSSIBLY A SPACE-BASED RADAR. THE POTENTIAL TO USE SPACE FOR NAVIGATION, COMMUNICATION, AND SURVEILLANCE IS UNLIMITED. FROM SPACE A TRULY GLOBAL PERSPECTIVE IS POSSIBLE.

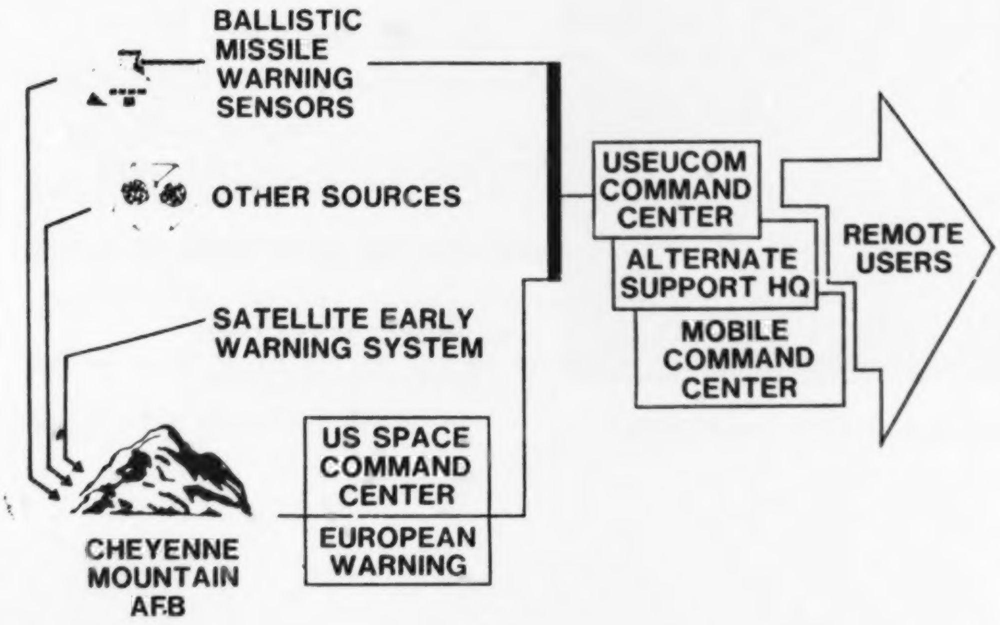
● SATELLITE CONTROL NETWORK UPGRADES

VANDENBERG AFB, CALIFORNIA

- REPLACE OBSOLETE EQUIPMENT
- REDUCE LIFE-CYCLE COSTS
- INCREASE DATA CAPACITY
- SUPPORT ADDITIONAL SATELLITE SYSTEMS

WE ARE ALSO IMPROVING THE SYSTEMS THAT CONTROL SPACECRAFT AND COLLECT, ANALYZE, AND DISTRIBUTE DATA OBTAINED FROM SPACECRAFT. MODERNIZED SYSTEMS WILL IMPROVE RELIABILITY AND SUSTAINABILITY AT GREATLY REDUCED COSTS. THESE NEW SYSTEMS ALSO INCREASE THE NUMBER OF SPACECRAFT THAT CAN BE CONTROLLED AT A GIVEN TIME. BUT ALL OF THESE THINGS WILL NOT BENEFIT THE FIELD COMMANDERS UNLESS WE ARE SUCCESSFUL IN GETTING THE INFORMATION TO THEM.

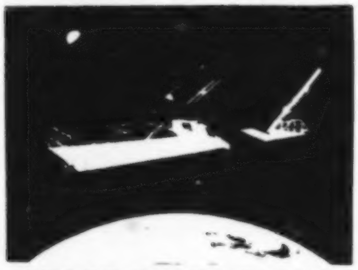
IMPROVED EUROPEAN WARNING


BALLISTIC MISSILE WARNING SENSORS
OTHER SOURCES
SATELLITE EARLY WARNING SYSTEM
CHEYENNE MOUNTAIN AFB
US SPACE COMMAND CENTER
EUROPEAN WARNING
USEUCOM COMMAND CENTER
ALTERNATE SUPPORT HQ
MOBILE COMMAND CENTER
REMOTE USERS

OUR INVOLVEMENT IN THESE EXERCISES STRENGTHENS OUR RELATIONSHIP WITH THE THEATER CINCs, ESPECIALLY HERE IN EUROPE. THROUGH THIS EXPANDED RELATIONSHIP, WE GAIN A BETTER UNDERSTANDING OF WARFIGHTING REQUIREMENTS AND THEY GAIN A BETTER UNDERSTANDING OF THE CAPABILITIES PROVIDED BY SPACE-BASED SYSTEMS. THROUGH THIS EDUCATIONAL PROCESS----WE BROADEN THE POSSIBILITIES FOR THE SPACE DIMENSION.

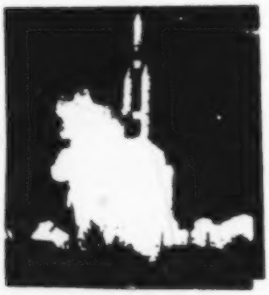
THE NEW DIMENSION

THE MILITARY APPLICATION OF SPACE



SPACE BASED RADAR

- SPACEPOWER WILL ASSUME AS DECISIVE A ROLE IN FUTURE COMBAT OPERATIONS AS AIRPOWER AND SEAPOWER HAVE TODAY



TITAN 34D

- THE FUTURE OF UNITED STATES MILITARY FORCES IS INEXTRICABLY TIED TO SPACE

THE NEW DIMENSION: THE MILITARY APPLICATION OF SPACE, IS INDEED AN OPPORTUNITY TO CHANGE THE NATURE OF FUTURE MILITARY OPERATORS. IT IS ALSO FULL OF CHALLENGES. SPACE CONTRIBUTES SIGNIFICANTLY TO U.S. AND ALLIED DETERRENT AND WARFIGHTING CAPABILITIES.

BUT WHILE U.S. AND ALLIED SPACECRAFT ARE CLEARLY SUPERIOR IN PEACETIME, EXISTING ASYMMETRIES MAY GIVE THE SOVIETS DECIDED ADVANTAGES IN TIME OF CRISIS OR COMBAT.

WE ARE MOVING TO CORRECT THESE ASYMMETRIES---- OUR SUPPORT TO THE WARFIGHTERS IS IMPROVING AND WE NEED YOUR HELP TO ENSURE THAT IT CONTINUES TO GET BETTER. THE U.S. IS MOVING AHEAD TO IMPROVE OUR WARTIME SPACE CAPABILITIES AND THE COUNTRIES OF THE FREE WORLD ARE BEGINNING TO WORK TOGETHER TO EXPLOIT THE BENEFITS OFFERED BY SPACE. NEW SPACE LAUNCH SYSTEMS, IMPROVED SATELLITES, QUICK TRANSFER OF DATA TO THE FIELD COMMANDERS, AND A WIDENING UNDERSTANDING OF THE CAPABILITIES AVAILABLE FROM SPACE WILL CAUSE A GROWTH IN THE NEW DIMENSION UNLIKE ANYTHING EXPERIENCED TO DATE.

AGAIN, CONGRATULATIONS ON 75 YEARS OF EXCELLENCE IN FLIGHT----ON BEHALF OF THE UNITED STATES AIR FORCE AND THE UNITED STATES SPACE COMMAND, I WISH YOU EVEN GREATER SUCCESS IN THE NEXT 75 YEARS.

THE IMPROVED EUROPEAN WARNING SYSTEM, IS AN EXAMPLE OF OUR INCREASED AWARENESS OF THE NEED TO GET SPACE-DERIVED INFORMATION TO THE THEATER COMMANDERS. THIS SYSTEM PUTS DATA DERIVED FROM GROUND SENSORS AND FROM SPACE SENSORS IN THE HANDS OF THE DECISION MAKERS FAR QUICKER THAN EVER BEFORE----WITHIN SECONDS OF A THREATENING LAUNCH. WHAT IS NEEDED NOW ARE INTERCEPT VEHICLES TO DESTROY INCOMING WARHEADS. WE MUST NOT LOSE SIGHT OF THE WARNING FUNCTION----TIMELY RELIABLE INFORMATION IN THE HANDS OF THE TERRESTRIAL COMMANDERS IS THE REASON FOR MILITARY SPACE OPERATIONS. BUT THIS IS A NEW ARENA AND TRAINING THE WARFIGHTERS IN THE USE OF SPACE IS ESSENTIAL.

TO THAT END, WE ARE PUSHING TO EXPAND "SPACE" PARTICIPATION IN EXERCISES----AND WE BELIEVE OUR EFFORT IS PAYING OFF. SPACE OPERATORS HAVE PARTICIPATED IN MANY RECENT EXERCISES, INCLUDING JOINING THE CINCCENT STAFF DURING THE JULY 1988 GALLANT KNIGHT EXERCISE IN THE UNITED STATES, OBSERVING THE LAST REFORGER EXERCISE HERE IN EUROPE, AND SPACE COMMAND WILL PARTICIPATE IN AN UPCOMING EUROPEAN COMMAND POST EXERCISE.

GENERAL JOHN L. PIOTROWSKI, USAF
AFA NATIONAL SYMPOSIUM
LOS ANGELES, CALIFORNIA
28 OCTOBER 1988

AMERICA IS AND WILL REMAIN SECURE BECAUSE----IN GREAT PART----OF HER INVOLVED, INFORMED PUBLIC. YOU, AS INDIVIDUAL CITIZENS, ARE AN EXTREMELY IMPORTANT PART OF THAT PUBLIC. BUT EVEN MORE IMPORTANT, YOUR AFFILIATION WITH THE AFA INCLUDES THE RESPONSIBILITY TO INFORM OTHERS AND TO ENCOURAGE THEIR INVOLVEMENT.

MY GOAL TODAY IS TO HIGHLIGHT SPACE-RELATED AREAS WHERE I BELIEVE THE PUBLIC AT LARGE NEEDS EDUCATING----I KNOW YOU'LL CONTINUE TO ACCEPT THE CHALLENGE TO SPREAD THE WORD.

IN KEEPING WITH THE FOCUS OF THIS YEAR'S AFA NATIONAL SYMPOSIUM----"THE U.S. AIR FORCE: TODAY AND TOMORROW," I'LL GIVE YOU A BRIEF UPDATE ON WHAT'S HAPPENED DURING THE LAST YEAR AND THE MAJOR PROGRAMS THAT ARE ON THE FRONT BURNER AT U.S. SPACE COMMAND. I BELIEVE THESE SPACE ISSUES ARE OF VITAL IMPORTANCE TO THE U.S. WARFIGHTING CINCs AND OUR NATIONAL SECURITY.

AS THE DEPARTMENT OF DEFENSE MILITARY PERSON RESPONSIBLE FOR PROVIDING SPACE SUPPORT TO OUR WARFIGHTING CINCs, I'VE BEEN LESS THAN HAPPY THAT WE HAVE NOT ALWAYS DEMANDED THAT OUR CRITICAL SPACE SYSTEMS HAVE THE SAME OPERATIONAL CHARACTERISTICS WE NORMALLY EXPECT IN LAND, SEA, AND AIR FORCES. PROVIDING SUCH CHARACTERISTICS FOR SPACE SYSTEMS IS A BIG PART OF "NORMALIZING SPACE OPERATIONS." SOMETHING I CONSIDER EXTREMELY IMPORTANT.

EXISTING SPACE SYSTEMS, TO INCLUDE THE LAUNCH INFRASTRUCTURE AND THE ON-ORBIT ASSETS, ARE NOT AS "READY" OR "SUSTAINABLE" AS ARE THE TERRESTRIAL ELEMENTS OF MILITARY POWER----NOT AS READY FOR EXAMPLE----AS A FIGHTER WING, A CARRIER BATTLE GROUP, OR AN ARMORED DIVISION.

LET ME EXPAND ON THIS. THERE IS NO DOUBT THAT TODAY, AT THIS VERY MINUTE, OUR SPACE-BASED ASSETS ARE PROVIDING TIMELY AND EXTREMELY FINE-GRAIN INFORMATION TO U.S. COMMANDERS. EXISTING SATELLITES HAVE CAPABILITIES AND RELIABILITIES THAT ARE WITHOUT EQUAL. THEIR SUPERIOR RELIABILITIES CARRIED THE UNITED STATES THROUGH THE LAUNCH HIATUS PRECIPITATED BY THE CHALLENGER AND OTHER LAUNCH VEHICLE ACCIDENTS OF 1986.

BUT WE MUST ASK OURSELVES IF WE CAN COUNT ON THESE ESSENTIAL SPACE SYSTEMS IN TIME OF A CRISIS OR CONFLICT. I BELIEVE THE CURRENT U.S. SPACE SYSTEMS ARE A FRAGILE, THIN BLUE LINE. A THIN LINE THAT IS NOT SUFFICIENTLY BACKED UP BY ON-ORBIT SPARES OR A RAPID REPLENISHMENT CAPABILITY. IN TIME OF CRISIS OR CONFLICT, THESE SYSTEMS COULD NOT BE RAPIDLY ROBUSTED OR SUSTAINED.

I'M HAPPY TO REPORT THAT THIS PRECARIOUS SITUATION IS CHANGING. WE ARE AT LAST BEGINNING TO INCORPORATE OPERATIONAL CONSIDERATIONS INTO THE REQUIREMENTS FOR FUTURE SYSTEMS.

THE NAVSTAR GLOBAL POSITIONING SYSTEM CONSTELLATION, FOR EXAMPLE, IS PLANNED TO HAVE THREE ON-ORBIT SPARES. ON THE OTHER HAND, PLANNING FOR SPARES IS SOMETHING THAT GOES ON CONTINUOUSLY FOR OUR AIR FORCES. TIME AND TIME AGAIN, YOU, THE AFA, HAVE FOUGHT FOR THE FUNDS TO PROVIDE THESE CRITICAL SPARES.

THE WARFIGHTING CINCs DEMAND THE SAME DEGREE OF READINESS AND SUSTAINABILITY FOR OUR SPACE FORCES. THEY DEPEND ON SPACE FOR THE CRITICAL FUNCTIONS OF COMMUNICATIONS, NAVIGATION, AND SURVEILLANCE.

PROVIDING ON-ORBIT, WAR RESERVE SPARES IS ONE WAY TO PROVIDE ASSURED MISSION CAPABILITIES FOR THESE ESSENTIAL FUNCTIONS. ANOTHER WAY IS TO PROVIDE A TIMELY REPLENISHMENT CAPABILITY.

WHILE WE ARE A LONG WAY FROM BEING ABLE TO LAUNCH "ON DEMAND," WE HAVE CLEARLY MOVED AWAY FROM A SINGLE THREAD LAUNCH SYSTEM----THE SHUTTLE. BUT STILL I'M NOT CONVINCED THAT OUR NEAR-TERM BOOSTERS----THE TITAN II, DELTA II, ATLAS II, AND TITAN IV----ARE YET RESPONSIVE ENOUGH TO SUPPORT THE SPACE REQUIREMENTS OF THE CORPS, THE CARRIER BATTLE GROUP OR THE WING COMMANDER IN TIMES OF CONFLICT.

THESE COMMANDERS NEED THE RESPONSIVENESS AFFORDED BY BEING ABLE TO PUT A CRITICAL PAYLOAD ON ANY BOOSTER CAPABLE OF LIFTING THE PAYLOAD'S WEIGHT. DESIGNING A LARGELY ONE-TO-ONE MATCH BETWEEN BOOSTERS AND PAYLOADS DOES NOT PROVIDE THE FLEXIBILITY NECESSARY FOR TIMELY REPLENISHMENT OF A SATELLITE THAT BECOMES A WARTIME LOSS.

WOULDN'T WE DISPATCH A C-5 WITH A PARTIAL LOAD IF THAT LOAD WAS CRITICAL TO SUCCESS ON THE BATTLEFIELD AND THE C-5 WAS THE ONLY AIRCRAFT IMMEDIATELY AVAILABLE? IT MIGHT NOT BE THE MOST EFFICIENT USE OF THAT INDIVIDUAL C-5, BUT WE WOULDN'T HOLD A CRITICAL SHIPMENT FOR A FULL-LOAD----NOR WOULD WE WAIT FOR A SMALLER AIRCRAFT.

THE CALL-UP AND PAYLOAD CHANGE-OUT CRITERIA ESTABLISHED FOR THE ADVANCED LAUNCH SYSTEM IS A GREAT MOVE FORWARD . . . A MUCH NEEDED OPERATIONALLY ORIENTED MOVE . . . IN THE DIRECTION OF RESPONSIVE LAUNCH, BUT IT'S YEARS AWAY. WE NEED TO EVALUATE THE BOOSTERS, PAYLOADS, AND OPTIONS PLANNED FOR THE NEAR TERM AND FIND WAYS TO INCREASE LAUNCH SUPPORT TO THE CINCs. WE ALSO NEED TO INCREASE THE SURVEILLANCE SUPPORT WE PROVIDE TO THE FIELD COMMANDERS.

A SPACE-BASED RADAR----POSSIBLY WITH AN INFRARED ADJUNCT SENSOR----WILL INCREASE SURVEILLANCE TO THE WARFIGHTING CINCs. A JOINT AIR FORCE/NAVY STUDY RECENTLY CONCLUDED THAT TECHNOLOGY IS AVAILABLE NOW FOR A RADAR BASED IN SPACE WHICH COULD PROVIDE NEAR REAL-TIME, ALL-WEATHER GLOBAL COVERAGE FOR DETECTING FIGHTER-SIZED AIRCRAFT AND DETECTING AND TRACKING AND CLASSIFYING SHIPS.

SUCH A SYSTEM WOULD ENHANCE THE CAPABILITY OF EACH THEATER CINC. LET ME OFFER SOME EXAMPLES. IN EUROPE, EARLY WARNING OF HOSTILE AIRCRAFT ACTIVITY----TRACKING FROM POINT OF ORIGIN----COULD GREATLY IMPROVE THE SURVIVABILITY OF ALLIED FORCES. IN THE NORWEGIAN SEA, FLEET OPERATIONS WOULD BE MORE EFFICIENTLY CONDUCTED IF AGGRESSOR AIRCRAFT OR VESSELS COULD BE EXACTLY----WITHIN A MILE----LOCATED AND TRACKED. AND IMAGINE THE IMPACT OF BEING ABLE TO TRACK, FROM ORIGIN, A SMALL AIRCRAFT FLYING AN UNSCHEDULED FLIGHT PLAN FROM NORTHERN COLUMBIA EN ROUTE TO SOUTHERN TEXAS. DRUG INTERDICTION WOULD BE MORE EFFECTIVE AND WOULD CERTAINLY CONSUME FEWER RESOURCES.

A SPACE-BASED RADAR SYSTEM WOULD ESSENTIALLY REMOVE THE HORIZON----A COMMANDER'S VISION WILL EXPAND WELL BEYOND ORGANIC ASSETS, IT WOULD INCLUDE HIS ENTIRE THEATER AND MORE----HIS PERSPECTIVE COULD BECOME GLOBAL.

A SPACE-BASED RADAR SHOULD CLEARLY BE PART OF TOMORROW'S AIR FORCE. IN TERMS OF A COMPETITIVE STRATEGY, SPACE-BASED RADAR OFFSETS HUNDREDS OF BILLIONS OF DOLLARS INVESTED BY THE SOVIET UNION AND OTHER COUNTRIES ON OFFENSIVE SYSTEMS THAT COULD THREATEN U.S. FORCES.

ANOTHER SYSTEM THAT I BELIEVE SHOULD BE IN OUR FUTURE IS A BALLISTIC MISSILE DEFENSE SYSTEM. IN 1983, WHEN THE PRESIDENT FIRST SET THE U.S. ON THE ROAD AWAY FROM "ASSURED" DESTRUCTION, HE ACKNOWLEDGED THAT IT MIGHT TAKE DECADES TO ELIMINATE THE THREAT OF BALLISTIC MISSILES.

TECHNOLOGIES ARE EVOLVING MUCH MORE RAPIDLY THAN MOST EXPECTED. THE SDIO WITH INDUSTRIES' ABLE ASSISTANCE IS TEARING AWAY THE TECHNICAL BARRIERS AND TURNING THE VISION OF A DEFENSE AGAINST BALLISTIC MISSILES INTO A REALITY.

BUT WHILE ASTOUNDING BREAKTHROUGHS IN TECHNOLOGY HAVE BEEN ACHIEVED, WE'VE FALLEN SHORT IN EFFORTS TO EDUCATE THE AMERICAN PEOPLE ON THE VALUE OF A BALLISTIC MISSILE DEFENSE SYSTEM----ONLY 39 PERCENT BELIEVE IT TO BE A COST EFFECTIVE OPTION FOR AMERICA. AS THE PRESIDENT HAS SAID, "IT IS EASIER TO BREAK IN NEW TECHNOLOGIES THAN NEW THINKING."

AS MOST OF YOU KNOW----I'M SURE MANY OF YOU HAVE BEEN THERE----MANY VISITORS TOUR THE COMMAND POST OF THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND AT CHEYENNE MOUNTAIN AIR FORCE BASE. THE TOUR USUALLY

CONCLUDES WITH A COMPUTER SIMULATION OF A BALLISTIC MISSILE ATTACK ON NORTH AMERICA. THIS SIMULATION IS PRESENTED TO DEMONSTRATE THE PROCESS OF WARNING AND ASSESSMENT.

IF I HAD A DOLLAR FOR EVERY PERSON THAT DID NOT REALIZE THAT THE UNITED STATES IS ABSOLUTELY DEFENSELESS AGAINST SUCH AN ATTACK----HAS NO WAY OF PREVENTING THE WHOLESALE DESTRUCTION OF AMERICAN LIVES AND SOCIETY----I WOULD HAVE ENOUGH MONEY TO FIELD AN INITIAL BALLISTIC MISSILE DEFENSE SYSTEM.

A BALLISTIC MISSILE DEFENSE SYSTEM WOULD RETURN THE FATE OF THIS NATION TO OUR CONTROL . . . SEIZING IT FROM THE SOVIETS. THAT'S RIGHT, TODAY THE SOVIETS CONTROL THE FATE OF THIS NATION----THEY CONTROL WHETHER OR NOT A BALLISTIC MISSILE ATTACK IS LAUNCHED AGAINST US AND SINCE WE DON'T HAVE BALLISTIC MISSILE DEFENSE, OUR FATE IS IN THEIR HANDS----AND THEIR PERCEPTION OF OUR WILLINGNESS TO STRIKE BACK! BUT MOST PEOPLE DON'T KNOW THIS.

MOST ARE UNAWARE THAT THE SOVIETS DEPLOYED A BALLISTIC MISSILE DEFENSE SYSTEM 20 YEARS AGO AND HAVE SPENT ROUGHLY 15 TIMES THE AMOUNT WE'VE SPENT ON THE STRATEGIC DEFENSE INITIATIVE. AND THERE ARE THOSE WHO BELIEVE THAT OUR EFFORTS TO RESEARCH STRATEGIC

DEFENSE INITIATIVE SIGNALS THE ABANDONMENT OF DETERRENCE RATHER THAN A WAY TO FORTIFY IT----A WAY TO GIVE THIS COUNTRY A DETERRENCE BASED ON A BALANCED DEFENSIVE AND OFFENSIVE STRATEGY RATHER THAN SOLELY ON THE THREAT OF RETALIATION.

THERE ARE MANY THINGS THAT ARE NEEDED IN THE WAY OF SPACE CAPABILITIES FOR TOMORROW. A U.S. ANTISATELLITE CAPABILITY, A SPACE-BASED RADAR AND A BALLISTIC MISSILE DEFENSE ARE AMONG THE MOST IMPORTANT AND ARE AREAS IN WHICH YOU CAN HELP. NOT ONLY IN BUILDING THESE IMPORTANT DEFENSE SYSTEMS BUT IN EDUCATING THE PUBLIC.

SPREAD THE WORD THAT A SPACE-BASED RADAR CAN, ON A VERY COMPETITIVE BASIS, DO THE THREE THINGS THAT EACH AND EVERY MILITARY SYSTEM MUST DO----SUPPORT THE CINCs, SUPPORT THE CINCs, AND SUPPORT THE CINCs. SPREAD THE WORD ALSO THAT TODAY THE UNITED STATES IS DEFENSELESS AGAINST A BALLISTIC MISSILE ATTACK AND THAT THE FATE OF OUR NATION, IN NO SMALL WAY, IS CONTROLLED BY THE SOVIET UNION.

I AGREE WITH THE SECRETARY'S BLUE RIBBON PANEL ON THE ROLE OF THE AIR FORCE IN SPACE. SPACE POWER WILL BECOME AS CRITICAL TO FUTURE MILITARY OPERATIONS AS SEA POWER AND AIR POWER ARE TODAY. FUTURE MILITARY OPERATIONS ARE INEXTRICABLY TIED TO SPACE.

SPACE----BECAUSE IT ENHANCES SUPPORT TO THE CINCs AND BECAUSE IT IS OUR BEST HOPE TO DEFEND AGAINST BALLISTIC MISSILES----IS CENTRAL TO THE "U.S. AIR FORCE: TODAY AND TOMORROW."

REVEREND CAMPBELL . . . .

GENERAL JOHN L. PIOTROWSKI, USAF
U.S. AEROSPACE DEFENSE STRATEGY
AND THE ROLE OF ALLIED COUNTRIES
CH'ONG JU, KOREA
9 NOVEMBER 1988

I AM DELIGHTED TO BE HERE TODAY TO DISCUSS A SIGNIFICANT, AND QUITE FRANKLY, VAST TOPIC----UNITED STATES AEROSPACE DEFENSE STRATEGY AND THE ROLE OF ALLIED COUNTRIES. OVER THE PAST 21 MONTHS AS THE COMMANDER IN CHIEF OF BOTH THE NORTH AMERICAN AEROSPACE DEFENSE COMMAND AND THE UNITED STATES SPACE COMMAND, I'VE HAD THE OPPORTUNITY TO DISCUSS AEROSPACE STRATEGIES WITH MANY OF OUR ALLIES----RANGING FROM OUR FRIENDS IN NATO TO OUR FRIENDS IN THE PACIFIC BASIN, INCLUDING AUSTRALIA, JAPAN, AND AT THE NATIONAL DEFENSE UNIVERSITY HERE IN KOREA.

MY POINT IS NOT TO PRESENT MY TRAVELOGUE, BUT TO UNDERSCORE THE IMPORTANCE THAT THE UNITED STATES ATTACHES TO OUR ALLIANCES AROUND THE WORLD. AS SECRETARY OF DEFENSE, MR CARLUCCI, HAS RECENTLY SAID, "OUR GREATEST ASSET IN DEALING WITH THE SOVIET UNION IS THE COLLECTIVE STRENGTH GENERATED BY OUR ALLIANCE

SYSTEM." THE STRATEGY OF FORWARD DEFENSE AND COLLECTIVE SECURITY WHICH RESULTS FROM THIS COMMITMENT HAS BEEN THE BASIS FOR U.S. NATIONAL SECURITY POLICY FOR OVER FORTY YEARS.

AS AN ISLAND NATION, AMERICA MUST DEPEND ON HER TRADING PARTNERS THROUGHOUT THE WORLD TO MAINTAIN BOTH A STABLE ECONOMY AND ACCESS TO THE RAW GOODS NECESSARY FOR MANUFACTURING. WORLD TRADE HAS LED TO A GROWING GLOBAL INTERDEPENDENCE OF COMMERCE AND ECONOMICS. SOUND SECURITY, POLITICS, AND ECONOMICS ARE INSEPARABLE.

IN THE LAST TWENTY YEARS, THE REPUBLIC OF KOREA HAS BECOME A RISING STAR IN THE INTERNATIONAL MARKETPLACE. YOU HAVE INAUGURATED A DEMOCRATICALLY ELECTED PRESIDENT AND YOU ARE PROSPERING AS A FREE NATION. NOW, UNDER YOUR NEW CONSTITUTION AND YOUR MULTIPARTY LEADERSHIP, YOU HAVE OPENED THE DOOR TO BUILDING A TRUE GOVERNMENT OF THE PEOPLE.

PRESIDENT REAGAN ON HIS 1983 TRIP TO KOREA BEST SUMMARIZED YOUR EFFORTS TOWARD A FREE SOCIETY WHEN HE SAID, "THE DEVELOPMENT OF DEMOCRATIC INSTITUTIONS IS THE SUREST MEANS TO BUILD THE NATIONAL CONSENSUS THAT IS THE FOUNDATION OF TRUE SECURITY."

THE UNITED STATES IS EAGER TO CONTINUE THE PARTNERSHIP WHICH HAS EXISTED BETWEEN OUR TWO NATIONS SINCE 1950----WE HAVE MUCH TO SHARE. SOUTH KOREA IS OUR SEVENTH LARGEST TRADING PARTNER AND THE FOURTH LARGEST MARKET FOR OUR AGRICULTURAL PRODUCTS. TOGETHER, OUR BILATERAL TRADE FIGURES IN 1987 TOTALED OVER 25 BILLION DOLLARS----THE EQUIVALENT OF 18 TRILLION WON. AS THE TWELFTH LARGEST TRADING NATION AND THE SEVENTEENTH LARGEST ECONOMY IN THE FREE WORLD, SOUTH KOREANS CAN BE JUSTIFIABLY PROUD OF THEIR ACCOMPLISHMENTS.

WITH THIS EXPANDED GROWTH AND CALL FOR DEMOCRACY, LET ME EMPHASIZE THAT NATIONAL SECURITY IS A PRECONDITION FOR DEMOCRATIC REFORM AND PROSPERITY. AND NATIONAL SECURITY IS WHAT I AM HERE TO TALK ABOUT.

THE SOVIET UNION HAS RAISED ITS PRIORITIES IN EAST ASIA IN THE 1980s. THE SOVIETS ARE NOT BLIND TO THE ACCELERATED ECONOMIC DEVELOPMENT IN THE REGION OR TO THE NEED TO INCREASE THEIR OWN TRADE RELATIONS WITH ITS NEIGHBORS TO THE EAST. ADDITIONALLY, THE STRATEGIC IMPORTANCE OF THE AREA IS BECOMING OF INCREASING CONCERN TO THEM AND THE SUBJECT OF GREATER DIPLOMATIC MANEUVERING.

IN CONTINUING SUPPORT OF NORTH KOREA, THE SOVIETS HAVE INTRODUCED NEW FIGHTER AIRCRAFT, SURFACE-TO-AIR MISSILES, AND ANTIAIRCRAFT GUNS. THEY HAVE COMBINED NAVAL EXERCISES WITH THEIR NORTH KOREAN ALLIES, CONDUCTED SYMBOLIC PORT VISITS AND AIRCRAFT EXCHANGES, AND COOPERATED IN INTELLIGENCE-GATHERING EFFORTS. NORTH KOREANS HAVE PERMITTED OVERFLIGHTS BY BOMBERS [TU-16 BADGERS], NAVAL RECONNAISSANCE COLLECTORS [TU-95 BEAR-D], AND STRIKE AIRCRAFT [TU-95 BEAR G]. SOVIET MILITARY POWER IS CASTING AN INCREASINGLY DEEPER SHADOW OVER ALL OF EAST ASIA.

THE SOVIET UNION HAS DEVELOPED A COMPREHENSIVE, INTEGRATED AEROSPACE DOCTRINE TO ACCOMPLISH THEIR STRATEGIC OBJECTIVES. SOVIET ARCHITECTS HAVE CRAFTED A DOCTRINE WHICH INTEGRATES ALL MILITARY FORCES----SEA, AIR, LAND, AND SPACE----INTO AN OVERARCHING FORCE----INTERWOVEN, YET INDEPENDENT----EACH ACCOMPLISHING THOSE TASKS FOR WHICH IT IS BEST SUITED. THIS COMPREHENSIVE STRATEGY HAS ALLOWED FOR THE DEVELOPMENT OF ACTIVE AND PASSIVE MILITARY SYSTEMS, OFFENSIVE AND DEFENSIVE PLANS OF ATTACK, AND COMPLEMENTARY FORCES.

AS EARLY AS 1960, THE OFFICIAL PARTY POLICY OF THE SOVIET UNION DECLARED THAT SOVIET FORCES MUST HAVE THE ABILITY TO SEIZE AND HOLD THE INITIATIVE THROUGHOUT A CONFLICT AS WELL AS FOR PROVIDING DEFENSIVE MEASURES

TO PROTECT THAT CAPABILITY. THAT HAS RESULTED IN THE DEVELOPMENT OF A PREEMPTIVE FIRST-STRIKE COUNTERFORCE CAPABILITY IN LAND, SEA, AIR, AND SPACE FORCES, AS WELL AS A COMMAND AND CONTROL SYSTEM CAPABLE OF COORDINATING THOSE ACTIONS.

THE IMPLEMENTATION OF THIS DOCTRINE HAS RESULTED IN THE DEVELOPMENT OF LARGE, FOURTH GENERATION, HARD- TARGET CAPABLE, INTERCONTINENTAL BALLISTIC MISSILES; IN PARTICULAR, THE SS-18, SS-19, AND SS-N-20s, ALL OF WHICH SATISFY THE REQUIREMENT FOR A FIRST-STRIKE CAPABILITY. SEVERAL OF THESE SYSTEMS ARE CAPABLE OF FLEXIBLE TARGETING RESULTING IN A EURASIAN THREAT AS WELL AS A TRANSOCEANIC THREAT. TO MEET THEIR SURVIVABILITY REQUIREMENTS, THEY HAVE DEPLOYED BOTH THEIR ROAD-MOBILE SS-25 AND RAIL-MOBILE SS-24 SYSTEMS AS WELL AS THEIR LONG-RANGE AS-15 NUCLEAR-ARMED CRUISE MISSILE.

LIKEWISE, THE MODERNIZATION OF THEIR ACTIVE STRATEGIC DEFENSIVE SYSTEMS INCLUDES AN UPGRADE TO THE ANTIBALLISTIC MISSILE SYSTEM THEY'VE MAINTAINED AROUND MOSCOW FOR TWO DECADES. THIS MODERNIZATION IS NEARLY COMPLETE AND INCLUDES SILO-BASED, HIGH ACCELERATION, INTERCEPTOR MISSILES AND THE ASSOCIATED GUIDANCE AND BATTLE MANAGEMENT RADAR SYSTEMS.

WITH THIS SORT OF BUILDUP, THERE IS NO QUESTION THAT THE SOVIET UNION HAS REJECTED THE NOTION OF MUTUALLY ASSURED VULNERABILITY AS WELL AS THE SPIRIT OF THE 1972 ANTIBALLISTIC MISSILE TREATY. IN ADDITION TO THE ACTIVE DEFENSES I HAVE ALREADY DESCRIBED, THEIR PASSIVE DEFENSES ARE EQUALLY IMPRESSIVE. THESE INCLUDE EXTENSIVE HARDENING AND MOBILITY NOT ONLY FOR THEIR OFFENSIVE WEAPONS BUT FOR THE PROTECTION OF THEIR LEADERSHIP AND THE MAINTENANCE OF THEIR COMMAND, CONTROL, AND COMMUNICATIONS STRUCTURE. IN AIR DEFENSE ALONE, THEY HAVE INCREASED THEIR RADAR INVENTORY TO APPROXIMATELY 7,000 STRATEGIC AIR DEFENSE RADARS, COUPLING THEM WITH VARIOUS SURFACE-TO-AIR MISSILES AND INTERCEPTOR AIRCRAFT.

SINCE THE 1960s, THE SOVIETS HAVE CONDUCTED EXTENSIVE RESEARCH IN DEVELOPING ADVANCED TECHNOLOGIES, SUCH AS LASERS, PARTICLE BEAM AND KINETIC ENERGY WEAPONS, AND HIGH POWER, RADIO FREQUENCY SYSTEMS AS A DEFENSE AGAINST BALLISTIC MISSILES. THIS WORK IS SIMILAR TO WHAT THE U.S. IS NOW INVESTIGATING IN ITS STRATEGIC DEFENSE INITIATIVE PROGRAM BUT THE SOVIETS ARE MOVING AHEAD WITH A MUCH GREATER INVESTMENT OF MANPOWER AND CAPITAL. THESE SYSTEMS COULD BE USED FOR A VARIETY OF PURPOSES INCLUDING STRATEGIC AIR DEFENSE, ANTISATELLITE WEAPONS, OR BALLISTIC MISSILE DEFENSE.

THE DOCTRINE THE SOVIETS HAVE DEVELOPED FOR SPACE INCLUDES NOT ONLY MAXIMUM ASSURANCE THAT SPACE-BASED SYSTEMS WILL BE AVAILABLE FOR THEIR OWN USE, BUT ALSO THE CAPABILITY TO DENY THE USE OF SPACE BY OTHER NATIONS. THEY CONSIDER SPACE OF PARAMOUNT IMPORTANCE TO ACHIEVING POLITICAL AND MILITARY OBJECTIVES; GENERAL SECRETARY GORBACHEV EMPHASIZED THAT POINT LAST YEAR WHEN HE STATED, "THAT HIS COUNTRY WILL NOT RELAX ITS EFFORTS AND LOSE ITS VANGUARD POSITION IN THE CONQUEST OF SPACE."

THE SOVIETS HAVE INVESTED HEAVILY IN ESTABLISHING A FORMIDABLE SPACE CONTROL CAPABILITY IN ORDER TO SATISFY THEIR DOCTRINAL GOALS. AS IS TRUE WITH THEIR LAND, SEA, AND AIR FORCES, THE SOVIET SPACE FORCES HAVE BEEN DEVELOPED WITH A COMBAT-ORIENTATION, INTEGRATED TO ACHIEVE THEIR OVERALL STRATEGIC GOALS WITH OFFENSIVE AND DEFENSIVE ELEMENTS.

THE SOVIETS CURRENTLY OPERATE ABOUT 50 TYPES OF DIFFERENT SPACE SYSTEMS FOR MILITARY AND CIVILIAN USES WITH A TOTAL OF APPROXIMATELY 170 OPERATIONAL SPACECRAFT ON ORBIT. THESE SYSTEMS INCLUDE THEIR MANNED SPACE STATION, AS WELL AS RECONNAISSANCE, LAUNCH DETECTION, NAVIGATIONAL, METEOROLOGICAL, AND COMMUNICATIONS SATELLITES. SOME OF THEIR SYSTEMS

PROVIDE A UNIQUE SERVICE TO THEIR WARFIGHTERS, SUCH AS THEIR RADAR OCEAN RECONNAISSANCE, AND ELECTRONIC INTELLIGENCE OCEAN RECONNAISSANCE SATELLITES USED TO LOCATE AND TARGET ALLIED NAVAL FORCES.

THE SOVIETS HAVE THE LARGEST AND MOST RESPONSIVE LAUNCH INFRASTRUCTURE IN THE WORLD. THEY CONTINUE LAUNCHING NEARLY SIX TIMES MORE THAN THE U.S. EACH YEAR----ONE SPACECRAFT EVERY THREE OR FOUR DAYS USING ONE OF EIGHT OPERATIONAL LAUNCH VEHICLES. THIS DEMONSTRATES GREAT FLEXIBILITY AND VERSATILITY IN THEIR ABILITY TO DEPLOY MILITARILY-SIGNIFICANT SPACE SYSTEMS. THEY HAVE ALSO CONTINUED TO EXPAND THEIR BOOSTER CAPABILITIES TO INCLUDE THEIR SL-17 ENERGIA BOOSTER WHICH WILL SOON CARRY THEIR SPACE SHUTTLE INTO ORBIT.

THEIR SPACE STATION IS NO LONGER AN EXPERIMENT AND OFFERS MANY ADVANTAGES OVER UNMANNED SYSTEMS. IT IS OBVIOUS THAT THE SOVIETS ARE COMMITTED TO A PERMANENTLY MANNED PRESENCE IN SPACE WHERE THEY CAN CONDUCT EARTH OBSERVATION, TARGETING, RECONNAISSANCE, EXPERIMENTATION, AND COMMAND AND CONTROL ACTIVITIES.

TRUE TO THEIR DOCTRINE OF COMPLEMENTARY OFFENSIVE AND DEFENSIVE SYSTEM DEVELOPMENT, THE SOVIET UNION HAS DEVELOPED AND MAINTAINED THE WORLD'S ONLY OPERATIONAL ANTISATELLITE SYSTEM, A CO-ORBITAL

INTERCEPTOR. LAUNCHED BY THE SAME BOOSTER WHICH LAUNCHES SEVERAL OF THEIR TACTICAL SPACECRAFT----THE SL-11----THE SOVIET'S CO-ORBITAL ANTISATELLITE SYSTEM HAS BEEN VERY SUCCESSFUL IN TESTS.

IN ORDER TO MEET THEIR DOCTRINAL REQUIREMENTS OF SURVIVABILITY AND REDUNDANCY, THE SOVIETS HAVE USED A MULTI-PHENOMENOLOGY AND MULTI-MISSION APPROACH TO THEIR ANTISATELLITE EFFORTS. IN ADDITION TO THEIR CO-ORBITAL ANTISATELLITE, THE LASER FACILITY AT SARY SHAGAN, THE ANTIBALLISTIC MISSILE SYSTEM AROUND MOSCOW, THEIR ELECTRONIC WARFARE SYSTEMS, AND THEIR MANNED SYSTEMS ALL HAVE AN ASSESSED ANTISATELLITE CAPABILITY. WITH SUCH A MULTIFACETED SPACE INFRASTRUCTURE USED TO CONDUCT SPACE OPERATIONS, AND DENY THE USE OF SPACE BY OTHERS, THERE IS NO DOUBTING THE SOVIET GAME PLAN----THEY ARE IN SPACE TO STAY----AND INTEND TO DOMINATE.

SPACE SYSTEMS SUPPORT THEIR LAND, SEA, AND AIR COMBAT FORCES. THEY HAVE DEVELOPED THE CAPABILITY TO EXPLOIT THE SPACE MEDIUM, DEFEND THEIR SATELLITE SYSTEMS, DENY THE USE OF SPACE TO OTHERS, AS WELL AS CONTINUE TO MAINTAIN A FIRST-STRIKE OFFENSIVE CAPABILITY. ARTICULATED AS EARLY AS 1965, THE SOVIETS BELIEVE THAT MASTERY OF SPACE IS AN IMPORTANT PREREQUISITE FOR ACHIEVING VICTORY IN WAR HERE ON EARTH.

WITH THAT BACKGROUND ON WHAT I CALL THE THREAT, LET ME DESCRIBE THE UNITED STATES AEROSPACE DEFENSIVE STRATEGY.

BASED ON OUR NATIONAL MILITARY POLICY, OUR MOST IMMEDIATE CONCERN IS TO DETER SOVIET AGGRESSION. WITH THE SOVIET CONVENTIONAL AND NUCLEAR ARSENAL GROWING LARGER EACH YEAR, WE NEED A BALANCED FORCE CAPABLE OF DETECTING, TRACKING, AND, IF NECESSARY, DESTROYING SOVIET BALLISTIC AND CRUISE MISSILES AS WELL AS THEIR SPACE-BASED SYSTEMS.

OUR AIR DEFENSE SYSTEM----LIKE THE ONE IN KOREA----IS A COMBINATION OF COMMAND AND CONTROL CENTERS, GROUND RADARS, FIGHTERS ON ALERT STATUS THROUGHOUT NORTH AMERICA, AND AIRBORNE WARNING AND COMMAND AND CONTROL AIRCRAFT. OUR PRIMARY EMPHASIS INVOLVES THE CAPABILITY TO LOCATE AND DESTROY AIR-LAUNCHED CRUISE MISSILE CARRIERS BEFORE THEY LAUNCH THEIR WEAPONS. TO ACCOMPLISH THIS, WE HAVE HAD TO EXPAND BOTH OUR SURVEILLANCE CAPABILITY AND THE ABILITY TO OPERATE FIGHTERS FURTHER FROM OUR HOME BASES. WE HAVE IMPROVED OUR SURVEILLANCE BY INTRODUCING OVER-THE-HORIZON RADAR WHICH PROVIDES A SIGNIFICANTLY ENHANCED DETECTION CAPABILITY. IN

ADDITION, THE UNITED STATES AND CANADA ARE INSTALLING A NEW RADAR NETWORK IN NORTHERN CANADA CALLED THE NORTH WARNING SYSTEM, TO REPLACE THE 1950's VINTAGE DISTANT EARLY WARNING LINE.

WE HAVE IMPROVED OUR ABILITY TO OPERATE FURTHER FROM HOME BASES THROUGH THE INCREASED USE OF AIRBORNE WARNING AND CONTROL AIRCRAFT, TANKER AIRCRAFT, AND THE INTRODUCTION OF FORWARD OPERATING LOCATIONS IN THE CANADIAN AND ALASKAN ARCTIC. OUR FIGHTERS PERIODICALLY OPERATE FROM THESE LOCATIONS WITH VERY SUCCESSFUL RESULTS. IN THE FUTURE, WE EXPECT OUR OPERATIONS TO BE FURTHER ENHANCED BY CUING FROM A SPACE-BASED RADAR NETWORK. OUR EFFORTS NOW, AND EVEN MORE SO IN THE FUTURE, AMOUNT TO "SLAYING THE ARCHER BEFORE HIS ARROWS HAVE LEFT THE QUIVER."

ON THE OTHER HAND, THE U.S. SPACE CONTROL QUIVER IS EMPTY. TODAY WE HAVE NO ANTIBALLISTIC MISSILE SYSTEM OR ANTISATELLITE SYSTEM. OUR ACCESS TO SPACE IS LIMITED----WE HAVE VERY FEW BOOSTERS AND VERY LONG PREPARATION TIMES TO LAUNCH THEM. WE HAVE NEED FOR A WORLDWIDE SPACE SURVEILLANCE CAPABILITY, BUT SUFFER COVERAGE GAPS----ESPECIALLY IN DEEP-SPACE COVERAGE OVER THE EASTERN HEMISPHERE. WE HAVE NO ACTIVE OR PASSIVE SATELLITE DEFENSE SYSTEMS FOR PROTECTION. WE

HAVE A SPACE DOCTRINE THAT, AFTER THIRTY YEARS OF SPACE ACTIVITY, IS ONLY NOW BEING FULLY INTEGRATED WITH LAND, SEA, AND AIR FORCES. WE HAVE NO RESPONSE IN KIND TO A SOVIET ATTACK ON OUR SPACE SYSTEMS. BUT, AND I EMPHASIZE, THAT IS CHANGING.

WE ARE MOVING FORWARD TO DEVELOP A SPACE-BASED RADAR. WE ARE BUILDING NEW SPACE SURVEILLANCE SYSTEMS AND INVESTIGATING NEW WAYS TO CLOSE OUR COVERAGE GAPS. WE ARE WORKING TO IDENTIFY DIFFERENT SYSTEMS THAT WILL PROVIDE A FLEXIBLE, COMBAT-READY ANTISATELLITE CAPABILITY. WE ARE DEVELOPING IMPROVED LAUNCH DETECTION CAPABILITIES. AND WE ARE RESEARCHING THE TECHNICAL FEASIBILITY OF BALLISTIC MISSILE DEFENSES----A PROGRAM COMMONLY KNOWN AS THE STRATEGIC DEFENSE INITIATIVE OR SDI. ALTHOUGH I AM NOT DIRECTLY INVOLVED IN SDI RESEARCH, IT IS MY RESPONSIBILITY TO DEVELOP OPERATIONAL REQUIREMENTS AND OPERATIONAL CONCEPTS FOR A BALLISTIC MISSILE DEFENSE SYSTEM SHOULD THE DECISION BE MADE TO DEPLOY ONE.

THE OBJECTIVE OF PRESIDENT REAGAN'S SDI PROGRAM IS CLEAR. IT IS TO PROVIDE AN ENHANCED AND SAFER DETERRENT AGAINST THE USE OF NUCLEAR WEAPONS. THE SOVIET'S EXTENSIVE BUILDUP OF OFFENSIVE AND DEFENSIVE WEAPONS SINCE 1972 COINCIDENT WITH THE U.S. REDUCTION

OF STRATEGIC AIR DEFENSE SYSTEMS HAS RESULTED IN AN INCREASING NUCLEAR THREAT TO OUR WORLD. TO COUNTER THAT THREAT, PRESIDENT REAGAN BEGAN A PROGRAM AIMED AT DETERMINING WHETHER WE CAN BUILD A PROTECTIVE SHIELD CAPABLE OF INTERCEPTING BALLISTIC MISSILES AND THEIR WARHEADS BEFORE THEY REACH THEIR TARGETS. SDI PROVIDES A LONG-TERM HOPE OF MUTUALLY ASSURED SURVIVAL RATHER THAN ASSURED DESTRUCTION.

BEFORE I CONTINUE, LET ME DEPART FROM THE NATIONAL SECURITY ASPECTS OF STRATEGIC DEFENSE FOR A MOMENT. THE TECHNOLOGICAL AND ECONOMIC SPIN-OFFS OF THE U.S. COMMITMENT TO PUT A MAN ON THE MOON IN THE 1960s ARE STILL BEING FELT TODAY. EQUALLY IMPORTANT, THE POTENTIAL APPLICATIONS OF SDI RESEARCH ALSO HOLD GREAT PROMISE FOR A BETTER WORLD.

SDI RESEARCH WILL AFFECT MANY WALKS OF LIFE. THE MEDICAL BENEFITS IN DEVELOPING BIO-ACTIVE MATERIAL TO REPLACE HUMAN TISSUE OR BONES OR IN MODELING MOLECULAR STRUCTURES ESSENTIAL FOR DEVELOPING NEW DRUGS, OR IN EYE SURGERY, FOR INSTANCE, ARE STAGGERING. SDI RESEARCH MAY PROVIDE NEW, MORE EFFICIENT POWER SOURCES WHICH COULD SIGNIFICANTLY REDUCE THE DEMAND FOR FOSSIL FUELS. SAFER METHODS FOR FOOD PREPARATION AND HIGH-SPEED COMPUTER PROCESSES ALL HAVE THE POTENTIAL TO CHANGE OUR LIVES FOR THE BETTER.

SDI IS A RESEARCH PROGRAM WE MUST CONTINUE NOT ONLY FOR ITS CONTRIBUTION TO NATIONAL SECURITY, BUT ALSO FOR THE TECHNOLOGICAL ADVANCES WE EXPECT. BUT IT IS THE OBJECTIVE OF DETERRENCE THROUGH SPACE DEFENSE AND BALLISTIC MISSILE DEFENSE WHICH MUST DRIVE OUR EFFORTS AND BRING US TOGETHER AS ALLIES, FRIENDS, AND PARTNERS.

THE SDI RESEARCH PROGRAM IS ALSO A COMPLEMENT TO A VIGOROUS U.S. EFFORT TO SEEK EQUITABLE, VERIFIABLE REDUCTIONS IN OFFENSIVE NUCLEAR FORCES THROUGH ARMS CONTROL NEGOTIATIONS. A FUTURE DECISION TO DEVELOP AND DEPLOY EFFECTIVE DEFENSES AGAINST BALLISTIC MISSILES WOULD SUPPORT OUR POLICY AND THAT OF OUR PACIFIC ALLIES OF PURSUING SIGNIFICANT REDUCTIONS IN BALLISTIC MISSILE FORCES. IT ALSO PROVIDES A FURTHER INCENTIVE FOR NEGOTIATED REDUCTIONS. THE RECENT SUCCESS OF THE INTERMEDIATE RANGE NUCLEAR FORCES TREATY IN ELIMINATING SS-20s ON THE SOVIET EASTERN FRONT AS WELL AS THE WESTERN FRONT IS A GOOD EXAMPLE OF NEGOTIATING FROM A POSITION OF STRENGTH. THAT EFFORT WAS AIDED BY THE SUPPORT WE RECEIVED FROM OUR ALLIES IN THE PACIFIC REGION DURING THOSE CRUCIAL NEGOTIATIONS.

BECAUSE U.S. NATIONAL SECURITY IS INEXTRICABLY LINKED TO THAT OF OUR ALLIES, THE SDI PROGRAM INCORPORATES THE EXPLOITATION OF TECHNOLOGIES WITH POTENTIAL AGAINST SHORTER-RANGE BALLISTIC MISSILES ALONG WITH ICBMs AND SLBMs. THIS EFFORT COULD PROVIDE A SIGNIFICANT BENEFIT TO THE PACIFIC BASIN NATIONS BY ENHANCING DETERRENCE AGAINST NOT ONLY STRATEGIC NUCLEAR WAR, BUT ATTACKS BY CHEMICAL AND CONVENTIONAL WEAPONS CARRIED BY SHORTER-RANGE BALLISTIC MISSILES. AS YOU KNOW, THESE THREATS ARE REAL. TODAY, THE SOVIET UNION HAS ONE FOURTH OF ITS GROUND TROOPS, ONE THIRD OF ITS NAVAL STRENGTH, AND ONE FOURTH OF ITS AIR FORCES DEPLOYED IN THE FAR EASTERN THEATER.

WITHIN THIS CONTEXT, THE NEED FOR ALLIED SUPPORT FOR ARMS CONTROL AND DEVELOPING REALISTIC AND COMBAT-READY AIR, SPACE, AND BALLISTIC MISSILE DEFENSES SERVE TWO PURPOSES. THE FIRST IS TO STRENGTHEN OUR COLLECTIVE DEFENSE AGAINST THE SHADOW OF THE RED STAR. THE SECOND PURPOSE IS TO ENSURE EACH NATION'S SECURITY AND THE PRESERVATION OF DEMOCRATIC SOCIETIES OPERATING IN A FREE WORLD MARKET.

THE NEXT CHAPTER IN OUR RELATIONSHIP WILL BE ONE IN WHICH THE PACIFIC BASIN COUNTRIES TAKE A BROADER VIEW OF THEIR ROLE IN THE WORLD. YOU HAVE THE OPPORTUNITY TO TURN YOUR GROWING ECONOMIC POWER INTO A GREATER SOURCE OF PEACE AND STABILITY IN YOUR PART OF THE WORLD. HISTORY SHOWS US THAT THE PRICE OF INADEQUATE ATTENTION TO NATIONAL SECURITY IS UNACCEPTABLY HIGH.

AS WE APPROACH THE DAWN OF THE PACIFIC CENTURY, AMERICA'S COMMITMENT TO INTERNATIONAL SECURITY AND FREE TRADE IS GREATER THAN EVER. FOR ECONOMIC, POLITICAL, AND SOCIAL REASONS, WE SHOULD CONTINUE OUR COOPERATIVE EFFORTS. FOR SECURITY REASONS, WE MUST.

AGAIN, I THANK YOU FOR THIS OPPORTUNITY TO PARTICIPATE IN THIS IMPORTANT MEETING.

GENERAL JOHN L. PIOTROWSKI, USAF

INTERNATIONAL SECURITY STUDIES PROGRAM
THE FLETCHER SCHOOL OF LAW AND DIPLOMACY
"THE GEOSTRATEGY OF SPACE: THE VIEW FROM SPACE COMMAND"

CAMBRIDGE, MASSACHUSETTS
17 NOVEMBER 1988

GOOD AFTERNOON. I'M DELIGHTED TO BE HERE AND HONORED TO BE ON THE SAME PROGRAM WITH DIRECTOR BURNS AND GENERAL VESSEY.

OVER THE YEARS, THIS FORUM HAS ADDRESSED MANY ISSUES VITAL TO OUR NATION'S SECURITY. THIS YEAR AGAIN, YOUR FOCUS IS PARTICULARLY RELEVANT. AS WE BEGIN A NEW ADMINISTRATION, WE ARE FACED WITH A GROWING CONCERN OVER THE DEFICIT AND THE RESULTING CONSTRAINTS PLACED ON MILITARY EXPENDITURES. WE ARE FULLY EMBRACING ARMS CONTROL ON MANY LEVELS. WE ARE CLEARLY CHALLENGED BY A WIDE VARIETY OF DIFFICULT AND EVOLVING ISSUES----THE TOUGH ISSUES YOU ARE CONSIDERING TODAY AND TOMORROW.

BECAUSE IT IS ABSOLUTELY ESSENTIAL THAT NATIONAL SECURITY POLICY AND U.S. MILITARY CAPABILITIES ARE DEVELOPED BASED ON THE THREAT, I'LL FIRST PROVIDE A

best copy available

BRIEF SUMMARY OF SOVIET CAPABILITIES IN SPACE. AFTER THAT FOUNDATION HAS BEEN LAID, I'LL ADDRESS A COUPLE OF ISSUES I THINK ARE RELEVANT TO POLICY CONSIDERATIONS IN THE DECADE AHEAD. FIRST THE FOUNDATION.

AS SOME OF YOU MAY WELL REMEMBER, THIRTY-ONE YEARS AGO, THE WESTERN WORLD WAS STUNNED BY THE EARLY MORNING LAUNCH OF THE WORLD'S FIRST SATELLITE----THE SOVIET SPUTNIK. PRIOR TO THE LAUNCH OF THE SPUTNIK, FEW WESTERN ANALYSTS HAD QUESTIONED THE U.S. TECHNOLOGICAL SUPERIORITY OVER THE RUSSIANS. THAT LAUNCH JARRED OUR COMPLACENCY, AND IT BEGAN THE TECHNOLOGICAL EVOLUTION THAT ESTABLISHED U.S. SUPERIORITY IN THE SPACE.

BUT TODAY I WOULD SUBMIT THAT THE SOVIET UNION----DESPITE WHAT WE MIGHT CALL TECHNOLOGICAL DEFICIENCIES----HAS DEVELOPED A SUPERIOR OPERATIONAL STRENGTH IN SPACE----A STRENGTH BUILT ON THREE PIVOTAL CHARACTERISTICS: FORCE STRUCTURE, READINESS, AND SUSTAINABILITY. ONE COULD ARGUE THEY'VE EVOLVED AN OPERATIONAL STRENGTH BECAUSE OF THEIR TECHNOLOGICAL SHORTFALLS. THEY NEEDED TO LAUNCH OFTEN, THEY NEEDED ROBUST BOOSTERS AND THEY STILL HAVE THEM. AND THEY ARE VERY IMPORTANT TO THEM.

THE SOVIET FORCE STRUCTURE IS, FROM A MILITARY PERSPECTIVE, OPERATIONALLY IMPRESSIVE. ITS FORCE STRUCTURE INCLUDES EIGHT DISTINCTIVELY SEPARATE LAUNCH VEHICLES WITH A NINTH----THE SL-X-17----IN DEVELOPMENT. ONE OF THEIR BOOSTERS, THE SL-04, ALONE HAS LAUNCHED MORE TIMES THAN THE TOTAL NUMBER OF SUCCESSFUL U.S. SPACE LAUNCHES AND HAS DEMONSTRATED A VERY HIGH DEGREE OF RELIABILITY. THEIR ON-ORBIT ASSETS----OVER 150 SATELLITES WITH PREDOMINANTLY MILITARY MISSIONS----ARE CLEARLY READY TO SUPPORT THEIR TERRESTRIAL FORCES. FURTHERMORE, THESE SATELLITE CONSTELLATIONS ARE SUSTAINABLE. DURING THE FALKLANDS WAR, FOR EXAMPLE, THEY LAUNCHED 29 TIMES IN 69 DAYS----A CAPABILITY ONLY DREAMED OF IN THIS COUNTRY.

DURING THE FALKLANDS, THEIR ON-ORBIT SPACE ORDER OF BATTLE WAS ABOUT 100. THAT MEANS OVER THE LAST SIX YEARS, THEY HAVE INCREASED THEIR SPACE ORDER OF BATTLE BY 50 PERCENT. THAT'S FAIRLY SIGNIFICANT. WHAT'S EVEN MORE IMPRESSIVE IS THAT I DON'T THINK THE SOVIETS ANTICIPATED THAT THE BRITISH WERE GOING TO FIGHT----THEY COULD NOT HAVE PREPARED 29 SATELLITES, SOME OF THEM WITH SIGNIFICANT OPERATIONAL UTILITY WHICH APPEARED TO FOCUS ON THE FALKLANDS. SO, AT THE START OF THE WAR OR NEAR THE START, THEY RECOGNIZED AN OPPORTUNITY TO WATCH A NATO POWER IN

ACTION. THEY WERE ABLE TO GET SOME INSIGHT INTO WHAT THIS NATO COUNTRY'S CAPABILITIES IN WARFIGHTING WERE. SO, THEY LAUNCHED QUICKLY AND FOCUSED THEIR ENERGY ON THE FALKLANDS. WE CAN'T DO THAT.

BY NOW I'M SURE SOME OF YOU ARE THINKING "THAT'S ENOUGH GENERAL, STATISTICAL COMPARISONS AREN'T THE ENTIRE STORY." AND THEY AREN'T. THERE ARE OTHER CONSIDERATIONS . . . "QUALITY," FOR INSTANCE. I AGREE----WHEN ALL THINGS ARE CONSIDERED, THE U.S. IS CLEARLY THE PEACETIME LEADER IN SPACE. OUR SATELLITES ARE LONGER LIVED, FINER GRAINED, MULTI-CAPABLE, AND THE DATA RECEIVED FROM THEM IS FED EFFICIENTLY TO THE USERS. BUT IN ASSIGNING THE U.S. SPACE COMMAND MISSIONS, THE PRESIDENT DIDN'T CHARGE ME WITH COORDINATING PEACETIME SPACE REQUIREMENTS----MY RESPONSIBILITY IS MEETING WARTIME MILITARY REQUIREMENTS. I'M NOT CONVINCED THAT PEACETIME LEADERSHIP NECESSARILY EQUATES TO ASSURED MISSION CAPABILITY IN WARTIME. THE EXISTING U.S. SPACE FORCE STRUCTURE WHILE HIGHLY CAPABLE----IS A THIN BLUE LINE AND MIGHT NOT SERVE THE COMBAT NEEDS OF THE CORPS, THE BATTLE GROUP, OR THE AIR WING COMMANDER SHOULD DETERRENCE FAIL. IN WARTIME, NOT ONLY ARE COMMANDERS FACED WITH THE LOSS OF UNIQUE AND IMPORTANT CAPABILITIES ON OUR SIDE, BUT THESE SAME COMMANDERS WILL ALSO FACE SERIOUS THREATS FROM SOVIET SPACE SYSTEMS.

LET ME TELL YOU ABOUT TWO SOVIET CAPABILITIES THAT WE SEE AS MOST WORRISOME AND THREATENING TO U.S. MILITARY FORCES. THE FIRST OF THESE IS THEIR TACTICAL TARGETING SPACECRAFT----THE RADAR OCEAN RECONNAISSANCE SATELLITES AND ELECTRONIC INTELLIGENCE OCEAN RECONNAISSANCE SATELLITES. THESE SATELLITES PROVIDE REAL-TIME TARGETING DATA DIRECTLY TO SELECTED DEPLOYED FORCES. UTILIZING THIS SPACE-DERIVED TARGETING DATA, SOVIET ANTISHIP WEAPONS COULD ACCURATELY AND AT BEYOND-THE-HORIZON RANGES ENGAGE U.S. FORCES AT SEA. THE SECOND THREATENING SOVIET CAPABILITY IS THEIR FAMILY OF ANTISATELLITE SYSTEMS----THREATENING BECAUSE IT COULD BE USED TO DENY OUR FREEDOM TO USE SPACE.

AS YOU SHOULD NOW BE AWARE, THE SOVIETS POSSESS THE WORLD'S ONLY OPERATIONAL ANTISATELLITE SYSTEM. THEIR CO-ORBITAL ANTISATELLITE IS CAPABLE OF ATTACKING ALL U.S. AND ALLIED LOW-EARTH ORBITING SATELLITES, AND THEY HAVE OTHER ANTISATELLITE OPTIONS THAT CAN ESSENTIALLY DESTROY OR DEGRADE THE MAJORITY OF THE BLUE SPACE ORDER OF BATTLE. I'LL NOT RESTATE THE POINTS CAPT TURNER MADE DURING YOUR LAST SESSION. SUFFICE IT TO SAY THAT POLICYMAKERS AND STRATEGISTS THAT DISCOUNT SOVIET ANTISATELLITE CAPABILITIES AS CRUDE OR NONTHREATENING HAVE MISSED THE MARK.

POLICY AND STRATEGY ISSUES FOR THE NEXT DECADE MUST BE FOUNDED IN THE KNOWLEDGE THAT THE SOVIETS HAVE MILITARIZED SPACE, THAT THEY HAVE DEVELOPED DOCTRINE BASED ON THE CONTROL OF SPACE, AND THEY HAVE ACQUIRED THE MEANS TO ACHIEVE THAT DOCTRINE. IT'S CLEAR AND SIMPLE.

THE QUESTION THEN, IS, WHAT IS TO BE THE U.S. RESPONSE? HOW SHOULD U.S. SPACE POLICY AND STRATEGY EVOLVE TO MEET THIS THREAT? SHOULD WE DEVELOP AN ANTISATELLITE CAPABILITY? I BELIEVE WE MUST. SOME WOULD SUGGEST WE COULD NEGOTIATE IT AWAY. UNFORTUNATELY, MUCH OF THE SOVIET ANTISATELLITE CAPABILITY IS TREATY COMPLIANT. ANY SATELLITE COULD BE AN ANTISATELLITE WEAPON. SO, IT'S DOUBTFUL THAT ONE CAN EVER NEGOTIATE AWAY AND VERIFY THE NONEXISTENCE OF ANTISATELLITES. WILL THE FOCUS OF U.S. SPACE ACTIVITIES SHIFT TO THE OPERATIONAL NEEDS OF THE FIELD COMMANDERS? I COULD DISCUSS THESE SUBJECTS WITH YOU AT GREAT LENGTH----HOWEVER, TO SAVE TIME FOR YOUR QUESTIONS, LET ME FOCUS BRIEFLY ON SPACE CONTROL AND SUPPORT TO THE COMMANDERS IN CHIEF, OR CINCs, OF OUR WARFIGHTING COMMANDS. FIRST, LET'S TALK ABOUT SPACE CONTROL.

TODAY, U.S. SPACE CONTROL POSTURE IS, IN MANY RESPECTS, SIMILAR TO OUR AIR POWER POSTURE EARLY IN THIS CENTURY. POWERED FLIGHT WAS IN THE

DEVELOPMENTAL STAGES AND STRATEGIES FOR EMPLOYING THIS INFANT CAPABILITY TO ACHIEVE NATIONAL OBJECTIVES HAD NOT YET BEEN FORMULATED. AT THE BEGINNING OF THE FIRST WORLD WAR, AIR POWER WAS A "GENTLEMAN'S" ACTIVITY. RECONNAISSANCE AIRCRAFT PASSED EACH OTHER EN ROUTE TO RECONNOITER THE GROUND ACTIVITIES OF THE OPPOSING SIDE. THE "GENTLEMAN" PILOTS WAVED GREETINGS TO EACH OTHER AS THEY PASSED. BUT, WHEN OPPOSING COMMANDERS REALIZED THE RECONNAISSANCE FLIGHTS WERE IMPACTING THE OUTCOME OF THE GROUND CAMPAIGNS, THE "GENTLEMAN PHASE" OF AIR POWER ENDED AND----WELL----YOU KNOW THE EVOLUTION OF AIR POWER THAT FOLLOWED.

TODAY SPACE IS IN THE "GENTLEMAN PHASE"----WE WAVE IN PASSING. BUT LIKE THE COMMANDERS IN WORLD WAR I, THE SOVIETS LONG AGO REALIZED THAT THE OUTCOME OF ANY FUTURE LAND, SEA, OR AIR BATTLE WILL GREATLY DEPEND ON SPACE. REGRETTABLY, THAT AWARENESS IS JUST BEGINNING TO PERMEATE U.S. MILITARY CONSCIOUSNESS.

TODAY, THE U.S. DEPENDS ON SOVIET GOODWILL----THEIR GENTLEMANLY NATURE IF YOU WILL----FOR OUR USE OF SPACE IN A CONFLICT. BY THAT I MEAN, U.S. SATELLITES WILL ONLY BE AVAILABLE IN CRISIS OR WAR IF THE SOVIETS ELECT NOT TO EMPLOY THEIR SEVERAL

ANTISATELLITE CAPABILITIES . . . I, FOR ONE, AM CONVINCED THE SOVIETS ARE INCAPABLE OF SUCH STRATEGIC PHILANTHROPY. THEIR DOCTRINE SAYS THEY WILL EMPLOY ANTISATELLITES AGAINST OPPOSING SATELLITES AND THEIR SYSTEMS GIVE THEM THAT CAPABILITY. SOMETIMES I REFER TO THIS AS THE GARY POWERS DOCTRINE. THAT IS, WHEN THE SOVIETS WERE READY TO SHOOT DOWN GARY POWERS, THEY DID. WE'VE NEVER CLEARLY DEFINED THE DEMARCATION LINE BETWEEN NEAR EARTH AND SPACE. SCIENTISTS, PHYSICISTS, AND ASTRONAUTS MIGHT SAY THAT WHERE THE ATMOSPHERE ENDS IS WHERE SPACE BEGINS. BUT INTERNATIONALLY OR NATIONALLY, WE HAVE NOT DETERMINED THIS BOUNDARY. I BELIEVE THAT IF WE WERE TO LAUNCH A SYSTEM THAT THE SOVIETS WOULD FIND INIMICAL TO THEIR NATIONAL SURVIVAL, THEY COULD SHOOT IT DOWN AND THEY MIGHT SAY SOMETHING LIKE, "THE U.S. HAS LAUNCHED A SPY SATELLITE THAT IS A THREAT TO OUR NATIONAL SECURITY. WE CANNOT TOLERATE THIS AND WE WILL DO WHAT ANY NATION WOULD DO IN SELF-DEFENSE----WE WILL SHOOT IT DOWN."

- I WOULD BE INTERESTED IN YOUR PROPOSED RESPONSE.

OUR RELIANCE ON SPACE FOR THE FUNCTIONS OF COMMUNICATIONS, NAVIGATION, AND SURVEILLANCE, CREATES AN INCENTIVE FOR SOVIET ANTISATELLITE EMPLOYMENT. YET, WE LACK THE CAPABILITY TO DEFEND OUR SPACECRAFT, . . . TO REPLACE LOST

SPACECRAFT, . . . OR TO REMOVE THE ADVANTAGE AN OPPOSING COMMANDER WOULD OBTAIN FROM HIS SPACECRAFT. IN SHORT, THE EXISTING U.S. SPACE FORCE STRUCTURE LACKS A SPACE CONTROL CAPABILITY.

SPACE CONTROL IS NOT SPACE SUPREMACY. WE DON'T HAVE TO HAVE "SPACE SUPREMACY" TO HAVE SIGNIFICANT, USEFUL MILITARY SPACE CAPABILITIES. IN MY JUDGMENT, OUR STRATEGY FOR THE FUTURE NEED NOT STRIVE FOR ABSOLUTE CONTROL OF SPACE. WITHIN THE BOUNDS OF POLITICAL, TECHNICAL, AND FISCAL CONSTRAINTS----THAT IS PROBABLY NOT AN ACHIEVABLE STRATEGY----NOR IS IT NECESSARY.

BUT THE NATIONAL COMMAND AUTHORITIES AND THE THEATER CINCs REQUIRE SUPPORT FROM SPACE AND WE MUST DEVELOP STRATEGIES AND THE ATTENDANT CAPABILITIES TO ENSURE CONTINUED ACCESS TO AND SURVIVABILITY OF OUR SPACE SYSTEMS THROUGHOUT ALL LEVELS OF CONFLICT.

I WOULD SUGGEST A STRATEGY BASED ON OFFENSE AND DEFENSE. PERHAPS A PASSIVE DEFENSE FOR SOME SATELLITES----THOSE IN GEOSYNCHRONOUS ORBIT, AN ACTIVE DEFENSE FOR OTHERS----THOSE THREATENED BY THE SOVIET CO-ORBITAL AND DIRECT ASCENT ANTISATELLITE SYSTEMS, AND A ROBUST U.S. ANTISATELLITE CAPABILITY. WE REQUIRE A BALANCED FORCE IN SPACE JUST AS WE DO HERE ON THE EARTH.

A FULLY TESTED U.S. ANTISATELLITE CAPABILITY WILL STRENGTHEN OUR DETERRENT POSTURE BY PLACING AN IDENTIFIABLE PENALTY ON SOVIET AGGRESSION. AS WITH MOST WEAPONS, KNOWING A RESPONSE IN KIND IS POSSIBLE RESTRAINS USE! IF DETERRENCE FAILS, AN ANTISATELLITE CAPABILITY WOULD GIVE US THE WHEREWITHAL TO INTERDICT THE SOVIET SPACE SYSTEMS. SOME DEGREE OF SPACE CONTROL IS NECESSARY IF WE ARE TO ASSURE THE SPACE SUPPORT REQUIRED BY THE NATIONAL COMMAND AUTHORITIES AND THE BATTLE AREA COMMANDERS IN TIME OF CONFLICT. PROVIDING THIS SUPPORT IS ALSO A CRITICAL MISSION OF U.S. SPACE COMMAND.

AS YOU HEARD DURING CAPT TURNER'S PRESENTATION, THE IMPACT OF EXISTING AND PLANNED SPACE SYSTEMS ON TACTICAL OPERATIONS IS SIGNIFICANT. WE ARE FIELDING PRECISE NAVIGATION (GPS) AND SURVIVABLE COMMUNICATIONS (DSCS) SATELLITES TO IMPROVE SPACE SUPPORT TO TERRESTRIAL MILITARY FORCES. IN ADDITION, I BELIEVE WE SHOULD FIELD A SPACE-BASED SURVEILLANCE SYSTEM----PERHAPS A RADAR/INFRARED COMBINATION---- THAT CAN DETECT AND TRACK ENEMY FORCES FROM POINT OF ORIGIN, IN ALL WEATHER CONDITIONS. THESE NEW SYSTEMS WILL CERTAINLY IMPROVE TACTICAL DECISION MAKING. AND I THINK IT WOULD BE A TREMENDOUS DETERRENT TO CONFLICT. IN THE CASE OF A SPACE-BASED SURVEILLANCE SYSTEM, I BELIEVE WE WILL FIND IT NECESSARY TO REEVALUATE THE GROUND RULES USED IN DEALING WITH

OTHER NATIONS----ALLIES AND ADVERSARIES ALIKE. A SPACE-BASED RADAR CAPABLE OF GLOBAL SURVEILLANCE ON A REAL-TIME BASIS WILL CLEARLY ALSO OFFER ADVANTAGES FOR OUR ALLIES. HOW WILL THEY PARTICIPATE? WHAT WILL THEIR ROLE BE?

WITH REGARD TO ADVERSARIES, THE IDEA OF "PLAUSIBLE DENIAL" WILL NO LONGER BE POSSIBLE WITH GLOBAL TRACKING OF SHIPS AND AIRCRAFT. PREPARATION AND INITIATION OF AN ATTACK BY ONE COUNTRY ON ANOTHER COULD BE OBSERVED FROM SPACE----ESSENTIALLY MAKING THE WORLD A FISHBOWL. TO MY WAY OF THINKING, SUCH A CAPABILITY IS A POWERFUL DETERRENT. UTILIZING THE CAPABILITIES OF A SPACE-BASED RADAR INVOLVE KEY POLICY DECISIONS IN THE DECADE AHEAD. AND THERE ARE OTHER SUCH AREAS, SUCH AS DRUG INTERDICTION, WHERE SPACE-BASED SURVEILLANCE WILL BE VERY USEFUL.

CONSIDER, FOR EXAMPLE, THE INCREASING NUMBER OF SATELLITES COMPETING FOR A FINITE NUMBER OF GEOSTATIONARY LOCATIONS; WILL IT BE NECESSARY TO ESTABLISH BOUNDARIES IN SPACE? FOR EXAMPLE, RIGHT NOW THE GEOSTATIONARY BELT IS WELL POPULATED. ON THE AVERAGE, WE WOULD WANT AT LEAST 1 DEGREE OF SEPARATION BETWEEN SATELLITES. THAT MEANS THERE IS ROOM FOR ONLY 360 SATELLITES. THE BELT IS GETTING CROWDED. HOW DO INTERNATIONAL BODIES ADJUDICATE WHO HAS WHAT POSITION IN THE GEOSYNCHRONOUS BELT?

AN INTERESTING PROBLEM. HOW WILL WE INTERACT WITH THE GROWING NUMBER OF OUR ALLIES WHO ARE ALSO COMPETING FOR THOSE LOCATIONS? CONSIDER THE NEED FOR TESTING----IN SPACE----THOSE COMPONENTS NECESSARY FOR A BALLISTIC MISSILE DEFENSE; IS A TEST RANGE IN SPACE NECESSARY? WHAT KIND OF RULES OF ENGAGEMENT WILL WE DEVELOP IF A BALLISTIC MISSILE DEFENSE SYSTEM IS DEPLOYED? I, QUITE FRANKLY, THINK THE RULES OF ENGAGEMENT ARE FAR MORE CRITICAL THAN ANY OTHER ELEMENT OF A BALLISTIC MISSILE DEFENSE SYSTEM.

THIS PROGRAM YOU'RE INVOLVED IN----THE INTERNATIONAL SECURITY STUDIES PROGRAM----WAS FOUNDED TO INTRODUCE THE STUDENTS TO "SOURCES OF CONFLICT, CONFLICT RESOLUTION, AND THE ROLE OF FORCE AND ITS LIMITATIONS IN INTERNATIONAL RELATIONS." SPACE-RELATED ISSUES IN THE COMING DECADE COULD BE THE FOCUS OF THE ENTIRE PROGRAM AND AFFORD YOU THE OPPORTUNITY TO DEAL WITH THE MOST DIVERSE OF ISSUES.

U.S. MILITARY FORCES ARE, WITHOUT QUESTION, LINKED TO SPACE. SPACE CANNOT BE SEPARATED FROM OUR NATIONAL SECURITY. THERE ARE MANY CHALLENGES, BUT SPACE POWER WILL BECOME AS CRITICAL TO FUTURE MILITARY OPERATION AS AIR OR SEA POWER IS TODAY.

I WOULD LEAVE YOU WITH A QUOTE BY JOHN F. KENNEDY FROM HIS INAUGURAL ADDRESS: "AMERICA CAN AFFORD TO BE STRONG; SHE CANNOT AFFORD TO BE WEAK. WE WILL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG." I APPRECIATE THE WORK YOU DO TO HELP MAKE AND KEEP HER STRONG.

GENERAL JOHN L. PIOTROWSKI, USAF
TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS
16 DECEMBER 1988

IT'S A SPECIAL THRILL FOR ME TO PARTICIPATE IN THIS COMMISSIONING CEREMONY AT THIS GREAT INSTITUTION WITH ITS WIDELY HELD AND RICHLY DESERVED REPUTATION FOR DEVELOPING OUTSTANDING MILITARY LEADERS AND GREAT PATRIOTS. AFTER THE CEREMONY TODAY, YOU WILL FIND YOURSELVES ON YOUR WAY TO DIFFERENT DESTINATIONS AND DIFFERENT PURSUITS. YOUR NEXT TRAINING GROUND WILL NOT ONLY TEST YOUR PROVEN ACADEMIC SKILLS, BUT IT WILL ALSO CHALLENGE YOUR EMOTIONS, YOUR COMMITMENT, AND YOUR RESPONSE TO A NEW AND DEMANDING ENVIRONMENT. IN THE LONG RUN, YOU WILL WALK AWAY FROM THAT EXPERIENCE KNOWING MORE ABOUT YOURSELF, YOUR STRENGTHS, YOUR WEAKNESSES, YOUR PRIORITIES, AND YOUR POTENTIAL.

EVEN THOUGH YOU'LL EMBARK ON DIFFERENT CAREER PATHS, LET ME TAKE A MOMENT TO REMIND YOU THAT ALL OF YOU HAVE BUT ONE PURPOSE. THAT IS TO DEFEND THE CONSTITUTION AND PROTECT THE CHERISHED FREEDOMS AND LIBERTY OF THE AMERICAN PEOPLE. YOU HAVE JOINED THE RANKS OF THE DEFENDERS, ENSURING THE LEGACY OF DEMOCRACY FOR YOUR GENERATION, YOUR CHILDREN AND ALL OF THOSE TO FOLLOW.

MY HOPE FOR THIS BRIEF MOMENT IN TIME, IS THAT I CAN LEAVE YOU WITH A MESSAGE THAT WILL CONTRIBUTE TO YOUR SUCCESSFUL CAREERS, REGARDLESS OF WHERE YOU APPLY YOURSELVES, WHETHER YOU CONTINUE YOUR MILITARY CAREER OR LATER SEEK REWARDS IN BUSINESS OR ACADEMIA. THESE ARE REALLY PHILOSOPHICAL WATCHWORDS THAT CENTER AROUND HOW WE APPROACH LIFE, DEAL WITH PEOPLE, AND ACCOMPLISH THE TASKS SET BEFORE US. MOST IMPORTANTLY, THEY COLLECTIVELY CONTRIBUTE TO THE HIGHEST GOAL FOR A MILITARY OFFICER----THAT IS, THE MAKING OF A GREAT LEADER.

THE FIRST POINT ON MY LIST IS THAT THROUGHOUT LIFE WE MUST NURTURE A POSITIVE ATTITUDE. ALL AROUND US WE FIND SPEAKERS WHO EXAMINE THE NEGATIVE STATE OF AFFAIRS AND RECALL THE PAST AS THE "GOOD OLD DAYS" NEVER TO RETURN. WE LISTEN TO COMMENTARIES ON THE DECLINE OF OUR ECONOMY, THE NATIONAL DEBT, THE STOCK MARKET "CRASH," AND THE DRAIN OF THE DEFENSE DEPARTMENT ON THE NATIONAL BUDGET. WE HEAR OF TECHNOLOGY TRANSFER, OUR DWINDLING PRESTIGE AMONG OUR WORLD PARTNERS, AND OUR FAILING STATURE AS A WORLD POWER.

CERTAINLY, GLOBAL ANXIETIES EXIST AND, IN FACT, FORM THE BASIS FOR THE U.S. REQUIRING A STRONG NATIONAL DEFENSE. BUT, TO QUOTE PAUL HARVEY, "IN TIMES LIKE THESE, IT'S USEFUL TO REMEMBER THAT THERE HAVE ALWAYS BEEN TIMES LIKE THESE." UNQUOTE. IN FACT, WHAT WE NEED IS THE ENERGY, IMAGINATION, AND LEADERSHIP TO MEET THE CHALLENGE OF MAKING OUR WORLD A BETTER PLACE TO LIVE. THE ENVIRONMENT WE CREATE FOR OURSELVES AND THOSE AROUND US SHOULD BE A MORE FRUITFUL, BENEFICIAL, AND POSITIVE LIVING SITUATION. POTENTIAL SOLUTIONS ARE RARELY FOUND AMONG THE PROPHETS OF DOOM. EMERSON SAID, "NOTHING GREAT IS EVER ACHIEVED WITHOUT ENTHUSIASM"----I'LL GO ONE STEP FURTHER THAN WALDO, "I DON'T BELIEVE ANYTHING IS ACHIEVED WITHOUT ENTHUSIASM."

OF COURSE, IT TAKES MORE THAN OPTIMISM TO THREAD THE ROCKS AND SHOALS THAT BLOCK THE WAY. THERE IS NO SUBSTITUTE FOR HARD WORK. YOUR HARD-EARNED DIPLOMA AND YOUR COMMISSION OFFER YOU NO GUARANTEE OF CONTINUED SUCCESS. YOU MUST MAKE FULL USE OF YOUR TALENTS AND REALIZE YOUR POTENTIAL IN ORDER TO TRULY EXPERIENCE THE JOYS OF ACCOMPLISHMENT. I'M REMINDED OF THE SMALL TOWN MINISTER WHO CAME UPON A REMARKABLY PROSPEROUS FARM. HE WALKED OVER TO THE FARMER WHO OBVIOUSLY WORKED THE LAND VERY HARD AND SAID, "BROTHER, THE LORD HAS SEEN FIT TO GIVE YOU AN AWFULLY WONDERFUL FARM." THE FARMER THOUGHT ABOUT

IT FOR A MINUTE AND SAID, "WELL, I GUESS THAT'S RIGHT PASTOR, BUT I WISH YOU'D SEEN IT WHEN HE GAVE IT TO ME." THE FARMER HAD OBVIOUSLY WORKED HARD AND WAS NOW REAPING THE BENEFITS OF HIS LABORS.

AS YOU LEAVE THE RATHER SEDATE AND PROTECTED GROUNDS OF THE UNIVERSITY, YOU WILL QUICKLY FIND OUT HOW MUCH YOU HAVE YET TO LEARN. NOT ONLY IS THE WORLD A CLASSROOM, BUT THE SENIOR ENLISTED PERSONNEL THAT WILL WORK FOR YOU ARE A TREASURE CHEST OF KNOWLEDGE AND EXPERIENCE. THEY WON'T EXPECT YOU TO KNOW EVERYTHING, BUT THEY WILL EXPECT YOUR INSPIRED LEADERSHIP.

REMEMBER THIS WELL: YOUR TOUGHEST AUDIENCE IS NOT GENERALS, ADMIRALS, OR YOUR SUPERIORS. WE'VE ALL BEEN LIEUTENANTS AND ENSIGNS AND EXPERIENCED FAILURE AND FRUSTRATION. ON THE OTHER HAND, THOSE YOU AND I LEAD HAVE THE HIGHEST EXPECTATIONS OF OUR LEADERSHIP, OUR WISDOM, AND OUR ABILITY TO FIND THE PATH TO SUCCESS AND TO VICTORY. I DOUBT WE CAN MEET THEIR EXPECTATIONS, BUT WE MUST ALWAYS DO OUR BEST. IT IS THE MANTLE AND MANDATE OF YOUR COMMISSION. AND, WITHOUT QUESTION, LEADERSHIP WILL MAKE THE CRUCIAL DIFFERENCE IN WHATEVER ORGANIZATION YOU FIND

YOURSELF----ESPECIALLY IN THE PLATOON, THE SHIP, OR THE SQUADRON WHERE MEN MAY BE ORDERED TO RISK THEIR LIVES. YOUR LEADERSHIP MAY BE THE DIFFERENCE BETWEEN THEIR SUCCESS AND THEIR FAILURE. AND SO MY THIRD POINT IS THAT YOU MUST WORK TO DEVELOP YOUR LEADERSHIP STYLE----WHATEVER APPROACH IS EFFECTIVE FOR YOU.

THERE ARE AS MANY BOOKS WRITTEN ON LEADERSHIP AS THERE ARE PEOPLE WHO TRY TO PRACTICE IT. MOST OF THEM AGREE THAT THE BASIC FRAMEWORK OF LEADERSHIP INVOLVES EXPRESSING A RESPECT FOR YOUR PEOPLE; ENSURING LOYALTY UP AND DOWN THE RANKS; LEADING BY EXAMPLE; SETTING CLEAR, OBTAINABLE OBJECTIVES; DELEGATING; RECOGNIZING TOP PERFORMANCE; KEEPING AN OPEN MIND; AND, ABOVE ALL, ENSURING YOUR OWN HONESTY AND INTEGRITY ARE ABOVE REPROACH. AND REMEMBER THAT LOYALTY IS NOT, I REPEAT, IS NOT BLIND OBEDIENCE TO ORDERS. THE MEN AND WOMEN WHO SERVE WITH ME THAT I ADMIRE THE MOST, ARE THOSE WHO STEP FORWARD AND FIND A PLEASANT WAY TO SAY, "GENERAL, I THINK YOU'RE WRONG, I DON'T THINK YOU HAVE ALL THE FACTS. AND WHILE I CAN DO WHAT YOU ASK, I THINK THE PRICE WILL BE TOO HIGH." AND NINE OUT OF TEN TIMES, I AGREE AND AM GRATEFUL THAT THEY HAD THE COURAGE TO STEP FORWARD.

YOU'VE STUDIED ALL OF THESE IDEAS----THE CHALLENGE NOW IS TO INTERNALIZE THEM; MAKE THEM A PART OF YOUR STYLE. TO QUOTE GENERAL PATTON, "WARS MAY BE FOUGHT WITH WEAPONS, BUT THEY ARE WON BY MEN. IT IS THE SPIRIT OF THE MEN WHO FOLLOW AND OF THE MAN WHO LEADS THAT GAINS THE VICTORY." UNQUOTE.

DEVELOPING A LEADERSHIP STYLE IS NOT THE EASIEST TASK BEFORE YOU. BEING A GOOD LEADER CAN BE DIFFICULT AND DISCOURAGING; AND IT CAN LEAD YOU DOWN A PATH THAT IS NOT WELL MARKED. YOU'LL FIND YOURSELF SHARING CREDIT FOR ACCOMPLISHMENT BUT ACCEPTING BLAME BY YOURSELF; BEING FACED WITH MAKING THE TOUGH, UNPOPULAR DECISIONS; HOLDING YOURSELF AND YOUR PEOPLE ACCOUNTABLE; CHOOSING BETWEEN THE EXPEDIENT OR THE POPULAR CHOICE, OR THE POPULAR THING TO DO, AND THE RIGHT THING TO DO. GENERAL MARSHALL, AN OUTSTANDING STRATEGIST AND STATESMAN, GAVE US ONE OF OUR MOST PROFOUND COMMENTS ON LEADERSHIP. WHEN ASKED WHAT CHARACTERISTIC HE LOOKED FOR MOST, HE SAID, "COURAGE IS THE MOST IMPORTANT CHARACTERISTIC OF LEADERSHIP----NOT THE COURAGE TO CHARGE THE HILL BUT THE COURAGE TO DO WHAT IS RIGHT." AND YOU'LL BE FACED WITH THAT CHALLENGE TIME AND TIME AGAIN. I ASK YOU TO REMEMBER MARSHALL'S RESPONSE.

YOUR EXAMPLE WILL SET THE BENCHMARK FOR YOUR ORGANIZATION BOTH ON A DAILY BASIS----REFLECTED BY YOUR PUNCTUALITY, YOUR PRESENCE, AND YOUR SENSITIVITY TO THOSE AROUND YOU----AND ON A LARGER SCALE BY DEFINING THE LEVELS OF LOYALTY, INTEGRITY, DEDICATION, AND PROFESSIONALISM YOU DEMAND OF YOUR PERSONNEL.

IT IS DIFFICULT TO EVEN IMAGINE THE WORLD YOU'LL SEE TWENTY YEARS FROM NOW. I CAME INTO THE AIR FORCE WHEN IT WAS JUST FIELDING OUR FIRST OPERATIONAL JET AIRCRAFT; BEFORE THE SOVIET UNION LAUNCHED SPUTNIK----WHICH HAPPENED THIRTY-ONE YEARS AGO----AND LONG BEFORE WE LANDED MEN ON THE MOON OR SERIOUSLY CONTEMPLATED A MANNED MISSION TO MARS. LOOK HOW FAR WE'VE COME! JUST IMAGINE HOW FAR WE CAN GO----HOW FAR WE MUST GO----TO DEFEND AMERICA! ONE THING THAT WILL CERTAINLY COME WITH THAT FUTURE TERRITORY IS THE DEMAND FOR LEADERS WITH IMAGINATION, FLEXIBILITY, AND SENSITIVITY WHO CAN ADAPT TO A CHANGING WORLD. I SUSPECT THAT MOST OF YOU WILL APPROACH YOUR MILITARY SERVICE WITH AN OPEN MIND, WILLING TO ENTERTAIN NEW IDEAS AND NEW POINTS OF VIEW. JUST LIKE ALL PROFESSIONS, MILITARY OFFICERS BEGIN TO DEVELOP THEIR OWN STEREOTYPED VIEW OF THE WORLD, WHICH OFTEN LEAVES LITTLE ROOM FOR CHANGE. AS JOUBERT SAID, "THOSE WHO NEVER RETRACT THEIR OPINIONS LOVE THEMSELVES MORE THAN THEY LOVE THE TRUTH." IT'S IMPORTANT TO RECOGNIZE WHEN OPINION DIFFERS FROM FACT.

GUARD AGAINST BECOMING ENTRAPPED BY DEVELOPING ONLY ONE WAY TO LOOK AT AN IDEA, A SITUATION, OR A TASK. DON'T ALLOW YOURSELF TO BECOME SATISFIED WITH THE STATUS QUO. ALWAYS WONDER, INQUIRE, AND EXPLORE NEW AVENUES. CONTINUE TO NOURISH THE SPIRIT OF INQUIRY THAT TEXAS A&M HAS STRIVEN TO INSPIRE. YOUR MIND IS LIKE A PARACHUTE----IT WON'T HELP YOU IF IT REMAINS CLOSED WHEN YOU NEED IT. YOU COULD PAY NO GREATER TRIBUTE TO THIS UNIVERSITY THAN TO MAINTAIN YOUR INTELLECTUAL FREEDOM AND INDEPENDENT PERSPECTIVE.

BEFORE I CLOSE, LET ME POINT OUT ONE MORE NECESSITY OF A SUCCESSFUL LIFE----THAT IS, MAINTAINING A HEALTHY SENSE OF HUMOR. IN A PERFECT WORLD, THIS WOULD NOT SEEM SO IMPORTANT. BUT LIFE IN THIS WORLD IS NOT PERFECT. IT IS IMPORTANT THAT WE RECOGNIZE EVENTS THAT OCCUR FOR WHAT THEY ARE AND LEARN TO DEAL WITH THEM AS PART OF THE INSTITUTION OR ENDEAVOR.

HAVING A SENSE OF HUMOR ALSO EXTENDS TO BEING ABLE TO LAUGH AT OURSELVES AND WITH OTHERS----NOT THE OTHER WAY AROUND. IT IS ESSENTIAL TO KEEPING OUR FEET ON THE GROUND AND IN TOUCH WITH REALITY.

LET ME CLOSE TODAY BY SAYING TO YOU NEW YOUNG OFFICERS THAT THERE ARE ONLY TWO INGREDIENTS REQUIRED TO BE SUCCESSFUL IN ANY WALK OF LIFE----THE MILITARY IS NO EXCEPTION. THESE TWO INGREDIENTS ARE ABILITY AND THE WILLINGNESS TO USE IT, TO USE IT ENERGETICALLY AND IN GREAT PROPORTION. SIX GUIDELINES THAT WILL WORK FOR YOU GO LIKE THIS:

- BECOME AN EXPERT IN YOUR FIELD. YOU DON'T HAVE TO KNOW THE LAST SCINTILLA OF KNOWLEDGE IN YOUR FIELD, BUT YOU DO NEED TO KNOW THE FIRST 95 OR 96 PERCENT.

- KNOW THE MAKE OR BREAK AREAS IN YOUR AREA OF RESPONSIBILITY AND MANAGE THOSE ABOVE ALL OTHERS----DON'T GET LOST IN THE TRIVIA.

- GO WHERE THE ACTION IS----DON'T LET YOURSELF BECOME ISOLATED FROM YOUR PEOPLE OR WHAT THEY'RE DOING----DON'T LET ANYTHING IMPORTANT HAPPEN WITHOUT YOUR PERSONAL INVOLVEMENT.

- BE ENTHUSIASTIC ABOUT YOUR RESPONSIBILITIES AND YOUR MISSION----IF YOU'RE NOT, NO ONE ELSE WILL----AND BE ACCOUNTABLE.

- TAKE CARE OF YOUR PEOPLE----AND THEY WILL TAKE CARE OF THE MISSION FOR YOU.

- ABOVE ALL ELSE, SET HIGH STANDARDS FOR YOURSELF AND YOUR UNIT----THEN PURSUE THEM WITH ALL YOUR ENERGY AND WITH CONFIDENCE.

AND WITH THAT, I ENTRUST TO YOU THE RESPONSIBILITY OF ENSURING AMERICA'S IDEALS AND VALUES ARE SAFEGUARDED. MAY YOU ALWAYS HAVE FAIR WINDS AND FOLLOWING SEAS, DRY FOXHOLES, AND SAFE LANDINGS.

GOD BLESS YOU ALL IN YOUR PURSUIT OF THE DEFENSE OF AMERICA. CONGRATULATIONS AND WELCOME ABOARD.

GENERAL JOHN L. PIOTROWSKI, USAF
NORAD CHRISTMAS PARTY
PETERSON AFB, COLORADO
16 DECEMBER 1988

LET ME ADD TO GENERAL McNAUGHTON'S GREETINGS FOR THE HOLIDAY SEASON AND SAY WELCOME TO THE NORAD----OUR FAMILY'S----CHRISTMAS PARTY.

I AM PLEASED TO TELL YOU THAT WE HAVE HAD MANY ACCOMPLISHMENTS THIS YEAR, NOT THE LEAST OF WHICH IS A GO-AHEAD FOR DEVELOPMENT OF A SPACE-BASED RADAR SYSTEM. THAT ONE PROGRAM ALONE WILL ENHANCE OUR EFFORTS TENFOLD. BUT, THE BOTTOM LINE IS THAT YOU ARE ALL DOING A SUPERB JOB AND I'D LIKE TO SAY THANK YOU.

THE GIFT YOU HAVE GIVEN TO ALL THE PEOPLE IN NORTH AMERICA IS A SPECIAL ONE. YOUR VIGILANCE . . . YOUR DEDICATION . . . YOUR BELIEF IN OUR MISSION COMBINE TO KEEP US SAFE, AND TO ENSURE OUR WAY OF LIFE.

SO TONIGHT, LET'S TAKE PRIDE IN WHAT WE DO AND HOW WE DO IT. AND LET'S NOT FORGET THE THOUSANDS OF PEOPLE WHO CONTRIBUTE TO OUR MISSION. THOSE STANDING ALERT AT FIGHTER BASES IN THE NORTHERN TIER

WHO FLY COVER FOR NORTH AMERICA . . . THOSE WHO MAINTAIN WATCH TO PROTECT OUR CONTINENT . . . THE HUNDREDS OF RADAR OPERATORS KEEPING AN EYE ON THE APPROACHES TO OUR HOMELAND. TOGETHER, THIS TEAM . . . OUR TEAM . . . IS THE BEST IN THE WORLD.

LET'S ALSO REFLECT ON THE FRIENDSHIP SHARED BY OUR TWO GREAT NATIONS, CANADA AND THE UNITED STATES. WE HAVE A PARTNERSHIP THAT EXCEEDS GEOGRAPHICAL CONCERNS AND TRULY BLENDS THE SPIRIT OF GOODWILL AND COMMON GOALS TO ACHIEVE OUR DEMOCRATIC WAY OF LIFE. EVEN THOUGH MOST OF US ARE A LONG WAY FROM HOME, OUR FAMILY HERE IS A CLOSE ONE.

LET ME WISH EACH AND EVERY ONE OF YOU A SAFE AND HAPPY HOLIDAY SEASON AND A NEW YEAR THAT BRINGS YOU AND YOUR LOVED ONES GOOD HEALTH, GOOD FORTUNE, AND TRUE JOY.

GENERAL JOHN L. PIOTROWSKI, USAF
HUSSON COLLEGE
BANGOR, MAINE
24 JANUARY 1989

GOOD MORNING AND THANK YOU, PRESIDENT BEARDSLEY, MR FARNHAM, LADIES AND GENTLEMEN, DISTINGUISHED GUESTS, FELLOW MILITARY MEMBERS, FRIENDS AND PATRIOTS ALL. IT'S REALLY GREAT TO BE HERE THIS MORNING AND HAVE THIS OPPORTUNITY TO SAY THANK YOU FOR THE WARM HOSPITALITY I'VE ENJOYED IN MAINE----AND, IN FACT, THE WARM WEATHER----AND TO BREAK BREAD WITH YOU, IN THE TRADITION OF FRIENDSHIP AND TO SHARE SOME THOUGHTS ABOUT SPACE.

BEFORE I GO ON, I DO WANT TO SAY ONE THING ABOUT PRIDE. I MENTION IT EVERYWHERE I GO, SO SOME OF YOU MAY HAVE HEARD ME SAY IT BEFORE. ONE OF THE MOST PRIDEFUL THINGS IN AMERICA TODAY IS OUR YOUNG PEOPLE. I'VE SEEN THOUSANDS OF YOUNG PEOPLE IN MY CAREER AND I'M GOING TO SEE SOME HERE IN BANGOR AT THE OVER-THE-HORIZON BACKSCATTER RADAR LATER TODAY. WE HAVE THE FINEST YOUNG MEN AND WOMEN COMING INTO THE MILITARY TODAY THAT I'VE SEEN IN MY 37 YEARS OF MILITARY SERVICE. THEY'RE BETTER EDUCATED, REGARDLESS OF WHETHER THEY ARE OFFICER OR ENLISTED.

THEY'RE MORE AWARE; THEY'RE COMMITTED. THEY BELIEVE THAT SERVICE TO COUNTRY, NATION, AND FELLOW IS AN HONORABLE PROFESSION. THEY'RE PROUD OF WHAT THEY DO.

WHERE DO THEY GET THAT? THEY GET IT FROM YOU, THEIR PARENTS. THEY GET THAT FROM PARENTS ALL OVER THIS GREAT NATION OF OURS. THEY GET THAT FROM INSTITUTIONS OF HIGHER LEARNING LIKE THIS ONE; FROM THEIR HIGH SCHOOLS, FROM THEIR GRADE SCHOOLS, AND THEIR TEACHERS. THEY'RE JUST WONDERFUL YOUNG PEOPLE. OF COURSE, THEY MAKE MY JOB EASY. THE EASIEST THING IN THE WORLD IS TO WORK WITH PEOPLE WHO ARE MOTIVATED TO DO THE JOB THAT THEY COME TO DO EVERY DAY AND WHO BELIEVE WHAT THEY'RE DOING IS IMPORTANT. SO, IT'S EASY TO BE THE LEADER OF A MILITARY ORGANIZATION THAT IS FILLED WITH PEOPLE LIKE THAT. I'M VERY GRATEFUL TO YOU FOR THE KIND OF PEOPLE YOU PROVIDE.

I WANT TO TALK A LITTLE BIT ABOUT SPACE. SPACE ISN'T VERY FAR FROM HERE IN FACT, IT'S ABOUT AS FAR AS BRUNSWICK. IT'S A LITTLE OVER A 100 MILES TO THE EDGE OF SPACE. BETWEEN HERE AND PORTLAND YOU COULD FIND A LOT OF SATELLITES AND YOU COULD GET THERE IN TWO HOURS IF YOU DROVE STRAIGHT UP---ABOUT AN HOUR AND A HALF IF YOU DROVE LIKE WILL FARNHAM.

BUT SPACE IS VERY USEFUL TO US. WE DO A LOT OF THINGS IN SPACE VERY EFFECTIVELY. WE COMMUNICATE VERY EFFECTIVELY FROM SATELLITES. IN FACT, MOST OF OUR PHONE CALLS AND THE TELEVISION THAT WE SEE COMES TO US VIA SATELLITE. WE ENJOYED THE SUPER BOWL, WE ENJOYED THE CALGARY OLYMPICS, AND THE SEOUL OLYMPICS VIA SATELLITE COMMUNICATIONS. AND THERE ARE MORE AND MORE COMMUNICATIONS SATELLITES GOING UP ALL THE TIME. IN FACT, THERE ARE ABOUT 450 ACTIVE SATELLITES IN SPACE TODAY. NEARLY HALF OF THEM ARE OPERATED BY THE SOVIET UNION. THE UNITED STATES OPERATES ABOUT 150 SATELLITES AND THE REST OF THE WORLD OPERATES THE REMAINING ONE-SIXTH.

I MENTIONED COMMUNICATIONS. NAVIGATION IS ALSO VERY IMPORTANT FROM SATELLITES. THE NAVY HAS LOCATED ITS SHIPS OVER THE LAST 20 YEARS VERY ACCURATELY WITH SATELLITES. NEXT MONTH WE'LL LAUNCH THE FIRST OF A SERIES OF OPERATIONAL SATELLITES THAT WILL ALLOW US TO LOCATE MEN, SHIPS, AND AIRPLANES WITHIN 50 FEET OF ANY LOCATION IN THE WORLD; THAT'S THREE-DIMENSIONAL LOCATION: ALTITUDE, LONGITUDE, AND LATITUDE. WE HAVE EXPERIMENTAL SATELLITES OPERATING NOW TO DO THAT JOB. WHEN OUR SAILORS WERE SENT OVER TO SWEEP THE MINES OF THE PERSIAN GULF THEY RELIED ON NAVIGATIONAL SATELLITES. IT'S VERY DIFFICULT TO KEEP TRACK OF WHERE YOU'VE BEEN IN A SHIP IF ALL YOU'RE DOING IS RELYING ON TERRESTRIAL MEANS. SO IF

YOU'RE SWEEPING FOR MINES YOU HAVE TO GO OVER THE SAME WATER AGAIN AND AGAIN TO MAKE SURE YOU'VE DONE THE JOB WELL. WITH SATELLITE NAVIGATION, THEY WERE ABLE TO PLOT EXACTLY WHERE THEY WERE. THAT RESULTED IN THEIR ABILITY TO SAIL A TRUE LINE AND SWEEP THE WATERS FOR MINES VERY SAFELY AND EFFICIENTLY.

WE ALSO ACCOMPLISH SURVEILLANCE FROM SPACE. WE SEE THE VALUE OF THAT EVERY DAY ON THE TELEVISION WHEN WE LOOK AT THE WEATHER MAP FOR THE NEXT DAY OR THE NEXT WEEK AND WHERE IT IS AND WHAT IT IS AND WATCH THE CLOUDS MOVING ABOUT. THAT'S VERY USEFUL IN A MILITARY SENSE. OUR SATELLITES GIVE US A MUCH BETTER VIEW OF WHAT'S GOING ON IN TERMS OF WEATHER AROUND THE WORLD. THOSE ARE THE KINDS OF THINGS WE DO WELL.

IT ALL STARTED IN OCTOBER 1957 WHEN THE SOVIETS LAUNCHED SPUTNIK. WE LEAPED VERY SHARPLY INTO SPACE LAUNCHING 50, 60, NEARLY 70 SATELLITES A YEAR FROM 1958 TO ABOUT 1965. IN FACT, WE WERE PROBABLY MOTIVATED BY PRESIDENT KENNEDY WHEN HE GALVANIZED THIS NATION TO PUT A MAN ON THE MOON. THE TECHNOLOGY TO BE GAINED FROM THAT ALLOWED US TO BUILD FEWER SATELLITES AND DO THE SAME JOB; TO GET GREAT GRANULARITY AND TO

SPEED INFORMATION TO THE PEOPLE WHO NEEDED IT VERY QUICKLY. AS A RESULT, WE STARTED LAUNCHING FEWER SATELLITES. WE WERE LAUNCHING IN THE NEIGHBORHOOD OF 15 TO 20 SATELLITES A YEAR WHEN THE CHALLENGER TRAGEDY OCCURRED.

THE SOVIETS, ON THE OTHER HAND, MOVED SHARPLY INTO SPACE, LAUNCHING AS MANY AS 100 LAUNCHES A YEAR, AND THEY'VE NEVER STOPPED. NOW THE REASON THEY LAUNCHED MORE SATELLITES OVER TIME THAN WE DID WAS BECAUSE THEY DIDN'T HAVE THE TECHNOLOGY. THEY HAD TO PUT SATELLITES UP MORE OFTEN, BECAUSE THEY DIDN'T LAST VERY LONG. AND THEY WEREN'T VERY GOOD. BUT, WHAT THE SOVIETS HAVE DONE IS BUILD AN OPERATIONAL STRENGTH FROM A TECHNOLOGICAL WEAKNESS. THEY LAUNCH OFTEN. LAST YEAR----94 SATELLITES; THE YEAR BEFORE----98. IN THE LAST EIGHT YEARS, THEY HAVE DOUBLED THEIR SPACE ORDER OF BATTLE. THEY HAVE DONE SOME THINGS TO SHOW US THEY ARE VERY SERIOUS ABOUT A WAR IN SPACE. IT'S AN INTERESTING THING TO TALK ABOUT; INTERESTING, BUT NOT COMPELLING IN THAT IF YOU HAVE A WAR IN SPACE YOU DON'T HAVE ANY FLAG-DRAPED COFFINS OR GRIEVING WIDOWS DESPITE THE LOSS OF A VERY SIGNIFICANT CAPABILITY.

WHAT THE SOVIETS HAVE DONE BY LAUNCHING VERY FREQUENTLY IS BUILD A LARGE INFRASTRUCTURE FOR LAUNCH ACTIVITIES. FOR EXAMPLE, DURING THE FALKLANDS

CONFLICT IN 1982 WHEN OUR NATO ALLY, THE UNITED KINGDOM, HAD A CONFLICT WITH THE ARGENTINIANS, THE SOVIETS THOUGHT IT WOULD BE VERY USEFUL TO FLY THEIR SATELLITES IN SUCH A WAY THAT THEY COULD OBSERVE WHAT THE BRITISH WERE DOING----HOW THEY COMMUNICATE, HOW THEY USE THEIR AIRCRAFT, HOW THEY USE THEIR SHIPS. SO, THEY LAUNCHED 31 SATELLITES OVER A PERIOD OF 69 DAYS. WHAT'S INTERESTING ABOUT THAT IS THOSE SATELLITES WERE ALL MILITARILY USEFUL. NOT KNOWING THAT WAR WAS GOING TO ERUPT, NOT KNOWING THAT THEY WOULD HAVE THIS OPPORTUNITY TELLS YOU THAT THEY HAVE TO HAVE WAREHOUSES FULL OF SATELLITES AND WAREHOUSES FULL OF BOOSTERS TO LAUNCH THEM. IF THEY SEE THE NEED, THEY CAN QUICKLY PUT A TREMENDOUS CAPABILITY INTO SPACE. IF YOU PUT THAT IN ANOTHER CONTEXT, THEY LAUNCHED MORE SATELLITES IN 69 DAYS THAN WE'VE LAUNCHED IN THE LAST FOUR YEARS.

HAVING SAID THAT, I HAVE TO SAY AGAIN THAT OUR SATELLITES ARE SO MUCH BETTER THAN THEIRS, SO MUCH FINER GRAINED, SO MUCH LONGER LIVED. IN FACT, WE'VE HAD SATELLITES WORKING WELL IN SPACE THE LAST 15 YEARS. IF THAT WEREN'T TRUE, WE WOULD NOT HAVE BEEN ABLE TO GET THROUGH THE CHALLENGER TRAGEDY AND THE RESULTING INABILITY TO PUT SATELLITES UP FROM THE SHUTTLE. OF COURSE, THE NATION HAD MADE A DECISION TO ONLY LAUNCH FROM THE SHUTTLE SO WE DIDN'T HAVE MANY BOOSTERS FOR ALL OUR SATELLITES. IF WE DIDN'T HAVE LONG-LIVED, FINE-GRAINED SATELLITES, WE WOULD HAVE BEEN IN VERY DIFFICULT TROUBLE WITHOUT THE SHUTTLE WHILE IT WAS BEING REBUILT AND MADE SAFER OR WHILE WE WERE BUILDING NEW BOOSTERS.

SOME MIGHT SAY THAT THE FACT THAT THE SOVIETS HAVE THIS TREMENDOUS CAPABILITY TO GET INTO SPACE QUICKLY AND TO LAUNCH FREQUENTLY IS NOT SIGNIFICANT. THAT WOULD BE TRUE IF IT WERE NOT FOR THE FACT THAT THEY HAVE THREE ANTISATELLITE WEAPONS. THEY HAVE THREE WEAPONS CAPABLE OF KNOCKING OUR SATELLITES DOWN. THEY HAVE AN ASAT WEAPON THAT THEY DEVELOPED SPECIFICALLY FOR THAT PURPOSE. IT IS A SATELLITE IN ITS OWN RIGHT. THEY LAUNCH IT, FLY IT IN FORMATION WITH ITS VICTIM, AND WHEN IT GETS VERY CLOSE, IT FIRES A SHOTGUN SHELL WHICH RIDDLES THE VICTIM WITH LARGE STEEL PELLETS WHICH DESTROY THE SATELLITE. IT'S A VERY EFFECTIVE WEAPONS SYSTEM. I WAS SURPRISED A COUPLE OF WEEKS AGO WHEN I WAS FLIPPING THROUGH THE TELEVISION CHANNELS TO SEE A DOCUMENTARY ABOUT HOW POOR IT WAS. I CAN'T TELL YOU EXACTLY HOW GOOD IT IS, BUT IT'S BETTER THAN 50 PERCENT EFFECTIVE. ITS BETTER THAN ANYTHING GENERAL PARKS AND I OR ANYBODY ELSE WHO WEARS A UNIFORM OR WORE A UNIFORM HAS GONE INTO COMBAT WITH. IT'S SAID TO BE CRUDE, BUT IT WORKS AND ITS PRETTY EFFECTIVE. THAT'S ONE OF THEIR CAPABILITIES.

THEY ALSO HAVE AN ANTIBALLISTIC MISSILE DEFENSE SYSTEM. IT, TOO, IS A VERY EFFECTIVE SATELLITE KILLER. IF YOU CAN HIT A SMALL REENTRY VEHICLE CARRYING NUCLEAR WEAPONS ABOUT THE SIZE OF A BREAD BOX, YOU CAN CERTAINLY HIT A SATELLITE THAT, WHEN IT'S UNFOLDED, WILL BE ABOUT THE SIZE OF THIS ROOM WITH BIG SOLAR PANELS AND OTHER COMPONENTS. SO IT'S A VERY, VERY EFFECTIVE ANTISATELLITE WEAPON.

THEY ALSO HAVE POWERFUL LASER WEAPONS. AT A PLACE CALLED SARY SHAGAN, THEY HAVE SOME MEGAWATT-CLASS LASERS THAT ARE CAPABLE OF DAMAGING OUR SATELLITES UP TO SEVERAL HUNDRED MILES.

THE SOVIET PHILOSOPHY IS THAT THEIR SPACECRAFT ARE JUST AN EXTENSION OF THEIR TERRESTRIAL FORCES. THEY BELIEVE IT IS IMPORTANT TO BE READY TO FIGHT IN SPACE AND THEY HAVE PREPARED THEMSELVES TO DO SO.

THE PROBLEM IS THAT WHILE OUR SATELLITES ARE BETTER, IN A VERY SHORT PERIOD OF TIME THE SOVIETS CAN REMOVE FROM SPACE MANY OF OUR MILITARILY SIGNIFICANT SPACECRAFT. IT HAS BEEN SUGGESTED THAT IT WOULD BE USEFUL TO NEGOTIATE AWAY ANTISATELLITE WEAPONS. I THINK THAT THE MOVEMENT FOR NEGOTIATING AWAY NUCLEAR WEAPONS AND CONVENTIONAL FORCES IS ALL GOODNESS. IT REDUCES THE TAX BURDEN. IT ALLOWS US TO LIVE WITH MORE CONFIDENCE THAT WAR MAY NOT COME

AGAIN, OR IF IT DOES, IT CERTAINLY WON'T BE THE TYPE OF WAR WE WOULD FACE WITH THE SOVIET UNION. ALL OF US IN THE MILITARY ARE WORKING HARD FOR THAT. SOMEBODY ONCE TOLD ME THAT NEGOTIATING WITH THE SOVIETS WAS LIKE GOING TO A WIFE-SWAPPING PARTY AND COMING HOME ALONE. YOU NEED TO BE VERY CAREFUL HOW YOU PROCEED . . . AND WE ARE. FORMER PRESIDENT REAGAN BELIEVED IN TRUST, BUT VERIFY. WE NEED TO TRUST BUT VERIFY BEFORE WE PROCEED.

THE PROBLEM WITH ANTISATELLITE SYSTEMS IS THAT THEY ARE TREATY COMPLIANT. THEIR ANTIBALLISTIC MISSILE SYSTEM THAT CAN SHOOT DOWN SATELLITES COMPLIES WITH THE ABM TREATY. THEIR SATELLITES THAT RUN INTO OTHER SATELLITES ARE TREATY-COMPLIANT BECAUSE WE DON'T HAVE ANYTHING THAT SAYS YOU CAN'T HAVE A SATELLITE; AND ANY SATELLITE CAN BE CAUSED TO FLY IN THE WAY OF OTHERS. THEIR LASERS ARE TREATY COMPLIANT.

SO, WE CAN HAVE THREE SITUATIONS: THE SOVIETS HAVE THE ABILITY TO KNOCK DOWN SATELLITES AND WE DON'T; WE BOTH HAVE THE CAPABILITY; NEITHER ONE OF US HAS THE CAPABILITY. SINCE WE CAN'T GET RID OF THEIRS, I THINK THE ONLY THING THIS NATION CAN DO IS DEVELOP THE CAPABILITY THAT WILL DETER THE SOVIETS FROM ATTACKING OUR SATELLITES BECAUSE THEY'VE BECOME SO IMPORTANT.

I WANT TO SAY THAT IT'S ONE OF THE NATION'S BIGGEST PRIORITIES TO BE ABLE TO OBSERVE FROM THE HIGH GROUND OF SPACE. WE ARE WORKING TOWARD THAT. IT IS AN AFFORDABLE CAPABILITY. WE KNOW HOW TO DO IT. I THINK IT'S IMPORTANT TO SAY IF WAR EVER COMES, WE WILL BE ABLE TO NEGATE SOVIET WARFIGHTING SATELLITES AND CERTAINLY WE NEED TO RESPOND IF THEY ATTACK OURS.

I WOULD LEAVE YOU WITH ONE THOUGHT. IT COMES FROM PRESIDENT KENNEDY DURING HIS INAUGURAL ADDRESS. HE SAID, "AMERICA CAN AFFORD TO BE STRONG. SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG." I THINK THOSE WORDS REMAIN TRUE AND ACCURATE TODAY. WE CAN AFFORD TO BE STRONG. WE CANNOT AFFORD TO BE WEAK. I APPRECIATE ALL YOU DO HERE TO MAKE AND KEEP AMERICA STRONG. THANK YOU VERY MUCH.

GENERAL JOHN L. PIOTROWSKI, USAF
ROTARY CLUB
BANGOR, MAINE
24 JANUARY 1989

THIS MORNING I'D LIKE TO TALK ABOUT THREE THINGS: SPACE AND THE IMPORTANCE IT PLAYS IN OUR QUALITY OF LIFE; OUR NATION'S NEED FOR AN EFFECTIVE, RELIABLE BALLISTIC MISSILE DEFENSE; AND THE YOUNG PEOPLE WHO ARE AT WORK TODAY KEEPING THIS NATION AND HER PEOPLE FREE.

WITHOUT THE ABILITY TO USE SPACE AND EMPLOY SPACE-BASED SYSTEMS, THIS COUNTRY WOULD GRIND TO A HALT. THERE WOULDN'T BE ANY TELEVISION, YOU'D HAVE TO GET THE WALL STREET JOURNAL AND USA TODAY BY MAIL, AND BY THE TIME THE NEWS REACHED US----IT WOULDN'T BE INTERESTING----IT WOULD BE HISTORY!

WITHOUT SATELLITES THERE COULDN'T BE ANY SUCH THING AS "INTERNATIONAL" OR "MULTINATIONAL" CORPORATIONS, SINCE ABOUT 70 PERCENT OF TRANSOCEANIC TELEPHONE TRAFFIC----BUSINESS TRAFFIC----IS HANDLED BY SATELLITES. NOT ONLY WOULD OUR QUALITY OF LIFE DECLINE, BUT OUR ECONOMIC VITALITY WOULD RAPIDLY ERODE.

TODAY MORE THAN 2,100 COMPANIES THROUGHOUT THE WORLD ARE DIRECTLY INVOLVED IN COMMERCIAL SPACE ACTIVITIES. IN THE NEXT DECADE, THESE ACTIVITIES ARE EXPECTED TO COMPRISE A 50 BILLION DOLLAR ENTERPRISE. COMMERCIAL SPACE MAGAZINE REPORTS THAT AS MANY AS 200 COMMERCIAL SATELLITES WILL BE LAUNCHED WITHIN THE NEXT 15 YEARS AT AN ESTIMATED COST OF AROUND 20 BILLION DOLLARS.

NOT ONLY IS SPACE IMPORTANT TO THE QUALITY OF OUR LIVES, IT IS ABSOLUTELY VITAL TO OUR SECURITY AS A NATION AND TO OUR POSITION AS THE LEADER OF THE FREE WORLD.

U.S. MILITARY FORCES RELY ON SPACE-BASED SYSTEMS FOR SURVEILLANCE, FOR COMMUNICATIONS, AND FOR NAVIGATION. SPACE-BASED SURVEILLANCE SYSTEMS PROVIDE STRATEGIC AND TACTICAL WARNING OF WHAT POTENTIAL ADVERSARIES MIGHT BE UP TO. THEY ALSO PROVIDE US WEATHER, INFORMATION ON SEA STATES, AND NUMEROUS OTHER KINDS OF ENVIRONMENTAL OBSERVATIONS.

COMMUNICATIONS SYSTEMS ALLOW OUR NATIONAL COMMAND AUTHORITIES TO SPEAK TO THE COMMANDERS IN CHIEF----OF OUR MILITARY FORCES WORLDWIDE.

NAVIGATION SATELLITES ALLOW LAND, SEA, AND AIR FORCES TO NAVIGATE WITH GREAT ACCURACY ANYWHERE IN THE WORLD.

MY SECOND POINT IS THAT THE BALANCE IN SPACE MAY HAVE SHIFTED. LET ME GIVE YOU SOME SPECIFICS.

THE SOVIETS PRODUCE FOUR TIMES AS MANY SCIENTISTS AND ENGINEERS AS THE UNITED STATES, WITH OVER 12 MILLION EMPLOYED IN THE SOVIET ECONOMY. THE UNITED STATES HAS LESS THAN 2 MILLION. THE SOVIETS HAVE AROUND 900 THOUSAND SCIENTISTS AND ENGINEERS INVOLVED IN RESEARCH AND DEVELOPMENT, WITH OVER 450 THOUSAND INVOLVED IN STRICTLY MILITARY RESEARCH AND DEVELOPMENT. U.S. INDUSTRIES EMPLOY ABOUT A THIRD OF THAT NUMBER IN RESEARCH AND DEVELOPMENT.

THE SOVIETS ANNUALLY CONDUCT FIVE TO TEN TIMES AS MANY SPACE LAUNCHES AS DOES THE UNITED STATES. FOR EXAMPLE, THEY HAVE TWICE AS MANY OPERATIONAL LAUNCH PADS. THEY ANNUALLY LIFT TEN TIMES THE WEIGHT TO ORBIT THAT OUR COUNTRY IS CAPABLE OF LIFTING. THEY HAVE A THREE TO ONE AND GROWING ADVANTAGE IN MANNED SPACE FLIGHT ACTIVITIES.

CLEARLY, THE SOVIETS HAVE INVESTED HEAVILY AND HAVE ESTABLISHED A WELL-BALANCED SPACE FORCE STRUCTURE. SOVIET MILITARY EXPENDITURES FOR

STRATEGIC FORCES HAVE REMAINED CONSISTENTLY BALANCED BETWEEN INVESTMENT IN BOTH OFFENSIVE SYSTEMS AND DEFENSIVE SYSTEMS. TOGETHER THEY ACCOUNT FOR ABOUT 20 PERCENT OF TOTAL SOVIET MILITARY SPENDING.

WHAT THE SOVIETS HAVE DONE IS THEY HAVE BUILT, OVER TIME, A SIGNIFICANT NUMBER OF INCREASINGLY BETTER AND NEWER SYSTEMS. IN FACT, LAST YEAR THE SOVIETS TESTED TO OPERATIONAL STATUS THEIR MOBILE ICBM SYSTEM, THE SS-24, WHICH IS RAIL-MOBILE AND REPLACES MANY OF THEIR OLDER SYSTEMS. IT HAS A MULTIPLE WARHEAD, SO ONE MISSILE CARRIES TEN WARHEADS AS OPPOSED TO ONE. THEY ALSO TESTED THEIR ROAD-MOBILE SYSTEM, THE SS-25, WHICH THEY NOW DEPLOY OPERATIONALLY. IT CAN BE HIDDEN IN THE FORESTS AND MOVED VERY QUICKLY IN A SHORT PERIOD OF TIME. IT GIVES THEM A SIGNIFICANT RESERVE FORCE.

AT THE SAME TIME, THEY HAVE FIELDED NEW, LONGER RANGE SUBMARINES. THE SOVIETS USED TO POSITION THEIR SUBMARINES OFF OUR COAST TO HOLD WASHINGTON AT RISK IN A SHORT TIME-OF-FLIGHT ATTACK, BUT NOW THEY HAVE IMPROVED THEIR SUBMARINES TO THE POINT THAT THEY NEVER HAVE TO LEAVE THE DOCK AND THEIR MISSILES CAN REACH NORTH AMERICA. THAT DOESN'T MAKE THEM VERY SURVIVABLE. IT JUST MEANS THEY CAN BE THERE AND STILL BE A FORCE AGAINST US.

WHAT CAN WE DO TO DEFEND OURSELVES AGAINST BALLISTIC MISSILE ATTACK? TODAY, WE CAN DO NOTHING. IN THE FUTURE, SDI WILL PROVIDE US WITH A DEFENSIVE CAPABILITY.

WHEN WE LOOK AT THE STRATEGIC DEFENSE INITIATIVE, THERE ARE FOUR VERY PEJORATIVE ARGUMENTS AGAINST IT. FORMER PRESIDENT REAGAN'S VISION, WHICH HE ANNOUNCED IN MARCH 1983, WAS A VISION OF THE FUTURE TO DRAW DOWN NUCLEAR WEAPONS ON BOTH SIDES AND TO BUILD A DEFENSIVE SYSTEM THAT WOULD MAKE A SOVIET ATTACK LESS LIKELY THEREBY REDUCING THE THREAT OF LARGE-SCALE NUCLEAR WAR. EVENTUALLY, HE HOPED THAT WE COULD ELIMINATE INTERCONTINENTAL BALLISTIC MISSILES ALTOGETHER.

THE ARGUMENTS THAT HAVE MOUNTED AGAINST IT ARE BASICALLY THESE FOUR: IT WON'T WORK, IT COSTS TOO MUCH, IT WOULD INVITE THE SOVIETS TO ATTACK, AND IT'S NOT LEAKPROOF. LET ME ADDRESS EACH ONE OF THOSE IN A VERY PRAGMATIC WAY.

THERE IS A GROUP OF SCIENTISTS WHO BELIEVE THE SYSTEM IS TECHNOLOGICALLY UNFEASIBLE. THAT'S LAUGHABLE BECAUSE THE SOVIETS FIELDED A SYSTEM THAT PERFORMS THAT MISSION NEARLY 20 YEARS AGO. THE

SOVIETS HAVE A BALLISTIC MISSILE DEFENSE. THEY HAVE ONE HUNDRED INTERCEPTORS CIRCLING MOSCOW DESIGNED TO INTERCEPT BALLISTIC MISSILES. AND THEY WORK.

BACK IN THE MID-1960s, WE DESIGNED A SIMILAR SYSTEM AND DECIDED NOT TO FIELD IT BECAUSE IT WAS THOUGHT TO BE TOO LARGE AN EXPENSE TO THE TAXPAYERS. WE THOUGHT IT WOULD BE CHEAPER, LESS DRAIN ON THE TREASURY, TO JUST BUILD BETTER OFFENSIVE SYSTEMS TO DETER THE SOVIETS FROM ATTACKING US. WE NOW HAVE THE TECHNOLOGY TO DEFEND AND IT SEEMS TO BE THE RIGHT THING TO DO. IN 1986, THE DEVELOPERS IN THE STRATEGIC DEFENSE INITIATIVE TESTED A GROUND-BASED, NONNUCLEAR DEVICE AGAINST ONE OF OUR REENTRY VEHICLES LAUNCHED AGAINST KWAJALEIN ISLAND WHERE WE DO OUR TESTING. IT SCORED A DIRECT HIT.

WE ALSO HAVE THE TECHNOLOGY TO BUILD HIGH-POWERED LASERS AND OTHER SYSTEMS THAT CAN ENGAGE REENTRY VEHICLES. THE SAME SATELLITES THAT I TOLD YOU WATCHED THE SOVIETS AND OTHERS LAUNCH MISSILES ALSO WATCHES THEM LAUNCH THEIR TEST REENTRY VEHICLES. THE SOVIETS HAVE AN ANTIBALLISTIC MISSILE SYSTEM THAT WORKS AND I'M CONVINCED WE CAN DEPLOY A SYSTEM THAT IS FAR BETTER THAN THEIRS THAT WOULD BE USEFUL IN DEFENDING AMERICA.

IT COSTS TOO MUCH? WHEN PRESIDENT KENNEDY GALVANIZED THIS NATION TO PUT A MAN ON THE MOON IN THE 1960s AND WE ALL WATCHED NEIL ARMSTRONG TAKE THAT FIRST SMALL STEP FOR MAN . . . THAT GIANT STEP FOR MANKIND, THIS NATION PAID ROUGHLY $30 BILLION TO ACHIEVE THAT GOAL TO PUT A MAN ON THE MOON. ANY FINANCIAL EXPERT KNOWS THAT IF YOU TAKE 1960s DOLLARS AND APPRECIATE THEM TO 1995 DOLLARS THAT $30 BILLION IN 1960 IS EQUIVALENT TO $100 TO $120 BILLION IN THE 1990s. WE SPENT THAT MUCH MONEY PUTTING NEIL ARMSTRONG ON THE MOON. IF THAT WAS WORTH IT----IT MUST BE WORTH IT TO SPEND LESS MONEY TO DEFEND NORTH AMERICA. TO DEFEND OUR VALUES, OUR CITES, OUR PEOPLE, OUR CHILDREN'S CHILDREN. AT THE SAME TIME, YOU'LL REMEMBER, WE HAD 300,000 TO 400,000 TROOPS ON THE GROUND IN VIETNAM FIGHTING A HIGH-DENSITY CONFLICT, EXPENDING ENORMOUS AMOUNTS OF ORDNANCE EVERY DAY AT THE END OF A 10,000-MILE PIPELINE.

IF WE CAN PUT NEIL ARMSTRONG ON THE MOON AND FIGHT A WAR OF THAT INTENSITY AT THE SAME TIME WE CAN AFFORD TO DEFEND AMERICA. IT'S NOT A TRIVIAL COST. IT'S ESTIMATED NOW TO COST IN THE NEIGHBORHOOD OF $60 BILLION. THAT'S OVER A DECADE. IT'S AFFORDABLE IF YOU COMPARE IT TO OTHER THINGS WE DO.

IT WOULD INVITE THE SOVIETS TO ATTACK? THAT'S LUDICROUS. THE SOVIETS ARE VERY RATIONAL PEOPLE WHEN IT COMES TO THEIR OWN SURVIVAL. THE SOVIETS ARE NOT GOING TO INVITE THEIR OWN DESTRUCTION BY ATTACKING US UNLESS THEY FEEL THAT THEIR NATION IS THREATENED IN THE FIRST INSTANCE. THAT MIGHT OCCUR OVER A WAR IN EUROPE, A WAR IN THE MIDDLE EAST OR SOUTHWEST ASIA, OR IT COULD OCCUR OVER A VARIETY OF CIRCUMSTANCES NONE OF WHICH I CAN FORECAST OR FORESEE. BUT THE POINT IS THAT THEY HAVE THE CAPABILITY TO DESTROY US AND DESTROY US VERY QUICKLY.

WE HAVE A SIGNIFICANT INTERCONTINENTAL BALLISTIC MISSILE FORCE AND A SIGNIFICANT FORCE OF BOMBERS AND SUBMARINES TO DETER THEM FROM DOING THAT, BUT WHAT WE REALLY HAVE IS A REVENGE FORCE. I THINK THAT IT IS NOBLE AND WISE TO BUILD DOWN THAT FORCE OF INTERCONTINENTAL BALLISTIC MISSILES AND REPLACE SOME OF IT WITH A DEFENSIVE CAPABILITY. NOT ONLY BECAUSE OF THE SOVIETS, BUT BECAUSE THERE IS INCREASINGLY GREATER THREAT OF ATTACK AGAINST AMERICA FROM A LUNATIC OR A MADMAN. SOMEBODY WHO IS SEEKING REVENGE OR WHO IS IN A RAGE.

WHO AM I TALKING ABOUT? I'M TALKING ABOUT THE KHOMEINIS AND THE QADDAFIS OF THE WORLD; OR THIRD WORLD POWERS. EVERY YEAR TECHNOLOGICAL CAPABILITIES INCREASE. SOON MANY SUCH NATIONS, INCLUDING THOSE

OPPOSED TO U.S. POLICY, WILL BE ABLE TO BUILD OR BUY MISSILES OF INTERMEDIATE OR GREATER RANGE. AND WHILE NOT EVERYONE CAN BUILD A NUCLEAR WEAPON----ALTHOUGH I THINK ANY COLLEGE PHYSICS STUDENT WITH ACCESS TO THE RAW MATERIALS COULD PUT ONE TOGETHER----WHAT I'M CONCERNED ABOUT ARE CHEMICAL WEAPONS WHICH ALMOST ANYONE CAN BUILD AND ARE VERY EFFECTIVE IN KILLING PEOPLE.

SO, IF YOU HAVE A SITUATION WHERE WEAPONS OF MASS DESTRUCTION ARE AVAILABLE AND THE DELIVERY VEHICLES TO GET THEM THERE ARE INCREASINGLY MORE AVAILABLE, WE CAN'T DO ANYTHING ABOUT IT EXCEPT WARN THE PRESIDENT THAT THEY ARE COMING. I REALLY BELIEVE THAT WE SHOULD HAVE THE MEANS TO DEFEND AMERICA. I DON'T THINK THE SOVIETS ARE GOING TO LAUNCH AN ATTACK TOMORROW, BUT WE OUGHT TO HAVE THE MEANS OF STOPPING THAT ATTACK OR SIGNIFICANTLY INCREASING THE DETERRENT FACTOR AGAINST IT. IT WON'T INVITE THE SOVIETS TO ATTACK US BECAUSE WE ARE ONLY DOING WHAT THEY HAVE ALREADY DONE AND WHAT IS TREATY-COMPLIANT.

NOW SOME WOULD ARGUE WE OUGHT TO GO BEYOND THE TREATY AND I THINK WE SHOULD. THERE ARE SOME THAT WOULD SUGGEST THAT THE SOVIETS ARE PREPARED TO GO BEYOND THE TREATY AND MAY DO THAT IN THE VERY NEAR FUTURE. I THINK THAT'S TRUE. WHY DO I THINK IT'S TRUE? BECAUSE WE ESTIMATE THAT THE SOVIETS TODAY HAVE A

MILLION POUNDS OF EXCESS LAUNCH CAPABILITY TO PUT THINGS INTO SPACE. NOW WE'RE ON THE SHORT SIDE. WE'RE JUST GETTING BACK TO LAUNCHING SATELLITES. THE SHUTTLE HAS FLOWN TWICE AND WILL FLY AT A MODEST RATE UNTIL THEY GET THEIR GAME PLAN BACK TOGETHER. WE'VE GOT ABOUT A THREE-YEAR BACKLOG OF SATELLITES THAT WE NEED TO GET INTO SPACE. THE SOVIETS HAVE A MILLION POUNDS OF EXCESS CAPACITY AND THEY ARE BUILDING TO TWO MILLION POUNDS OF EXCESS CAPACITY.

NOW YOU HAVE TO ASK YOURSELF WHY WOULD A NATION THAT'S INDUSTRIALLY POOR, AGRICULTURALLY POOR, ECONOMICALLY POOR, CONSUMER POOR, JUST POOR, POOR----WHY WOULD A NATION THAT'S IN THAT ECONOMIC SHAPE INVEST IN THE NEIGHBORHOOD OF $20 TO $30 BILLION TO BUILD A CAPACITY TO LAUNCH THINGS IN SPACE THAT THEY HAVE NO APPARENT NEED FOR? I BELIEVE THAT THEY HAVE ALREADY SOLVED THE LONG POLE IN THE TENT THAT WE HAVEN'T; THAT IS, HOW TO GET THE THINGS THAT WE WOULD DEVELOP INTO SPACE IN A SHORT PERIOD OF TIME. I DON'T THINK THE SOVIETS ARE GOING TO ATTACK US BECAUSE WE'RE DOING WHAT THEY'VE ALREADY DONE AND MORE THAN LIKELY WILL DO MORE OF. I THINK THE SOVIETS WOULD RESPECT IT FROM A MILITARY CAPABILITY.

THE LAST DEMAGOGIC ARGUMENT THAT PRAYS ON THE FEARS OF THE PUBLIC IS THAT IT'S NOT LEAKPROOF. ANYONE WHO COULD TELL YOU THAT WE COULD BUILD A LEAKPROOF

SYSTEM SHOULD BE LOCKED UP IN A RUBBER ROOM BECAUSE NOTHING IS PERFECT. WE CAN'T BUILD A LEAKPROOF SYSTEM ANYMORE THAN WE CAN BUILD A SINK-PROOF BATTLE SHIP OR AN AIRPLANE THAT CAN'T BE SHOT DOWN.

BUT WE CAN BUILD A SYSTEM THAT IS SO GOOD THAT THE SOVIETS WOULD KNOW WITHOUT A DOUBT THAT ANY ATTACK ON NORTH AMERICA WOULD NEVER ACHIEVE ITS DESIRED GOAL; COULD NEVER STOP THE PRESIDENT FROM ISSUING A RETALIATORY STRIKE; COULD NEVER SHUT DOWN OUR COMMUNICATIONS, OR REACH OUR MILITARY BASES AND DESTROY THE MISSILES BEFORE THEY LEFT THE SILOS OR OUR BOMBERS BEFORE THEY FLEW. THEREFORE, THE SOVIETS WOULD HAVE TO KNOW THAT THEIR ATTACK WOULD BE DETECTED, THAT WE COULD DEFEND AGAINST THAT ATTACK AND WE WOULD, WITH CERTAINTY, RETALIATE. THAT WOULD REDUCE THE LIKELIHOOD THEY WOULD EVER ATTACK IN THE FIRST PLACE.

I WOULD LIKE TO SHARE ONE OTHER THOUGHT WITH YOU----IT'S AN IMPORTANT ONE. THAT'S OUR PEOPLE, OUR MILITARY PEOPLE. I SAY IT EVERY TIME I GET AN OPPORTUNITY TO TALK TO A GROUP OF PARENTS OR GRANDPARENTS AS THE CASE MAY BE; THAT IS, THE YOUNG PEOPLE WE HAVE COMING INTO THE MILITARY TODAY, BOTH MEN AND WOMEN, OFFICER AND ENLISTED, ARE ABSOLUTELY SUPERB. THEY'RE BETTER THAN ANY I'VE SEEN IN THE PAST

37 YEARS, BY ANY STANDARD; BY ANY MEASURE. THEY'RE MORE EDUCATED, MORE COMMITTED, MORE AWARE; THEY BELIEVE WHAT THEY'RE DOING IS IMPORTANT. THEY'RE HAPPY TO SERVE. THEY BELIEVE THAT DEFENDING THEIR COUNTRY IS A NOBLE ENTERPRISE AND THEY'RE DELIGHTED TO BE PART OF IT. I SAY THAT BECAUSE THAT'S A RESULT OF WHAT YOU DO IN THIS COMMUNITY AND OTHER COMMUNITIES ACROSS THIS GREAT NATION OF OURS. OUR YOUNG PEOPLE ARE WONDERFUL. THERE MAY BE SOME THAT ARE TROUBLED AND WE CAN WORK THAT PROBLEM. THE ONES THAT COME IN THE SERVICE ARE JUST WONDERFUL AND I THANK YOU FOR IT. IT MAKES MY JOB EASIER.

I WOULD ADD TO THAT, THE COMPENSATION THAT THEY RECEIVE FOR THE JOB THEY DO, FOR THE HARDSHIPS THEY ENDURE, FOR THE SACRIFICES THEY MAKE----I'M TALKING ABOUT FREQUENT MOVES, TAKING CHILDREN OUT OF SCHOOL, TRANSPLANTING THEM IN OTHER SCHOOLS, GETTING STARTED ALL OVER AGAIN, AND THE COST OF DOING THAT----IS NOT ADEQUATE. THE OVERALL AVERAGE OUT-OF-POCKET EXPENSE FOR EVERY PERMANENT CHANGE OF STATION MOVE IS SOMEWHERE IN THE NEIGHBORHOOD OF $1,500 THAT THEY'RE NOT COMPENSATED FOR BY THE GOVERNMENT. IN THE AREA OF MILITARY PAY, THEY'VE ALSO SUFFERED A 10 TO 11 PERCENT DISADVANTAGE WITH THE PRIVATE SECTOR. IN OTHER WORDS, WHEN WE DECIDED TO GO TO AN ALL-VOLUNTEER FORCE IT WAS DECIDED THAT IN ORDER TO ATTRACT THE KIND OF PEOPLE WE ARE NOW ATTRACTING, WE'D HAVE TO PAY THEM. COMPARABLE WITH THEIR PRIVATE SECTOR COUNTERPARTS. IT WOULD NO LONGER BE A SUBSISTENCE INCOME, BUT TO GET PEOPLE TO COME IN WE'D HAVE TO PAY THEM A DECENT WAGE TO CLOTHE THEIR CHILDREN, FEED THEIR FAMILIES, EDUCATE THEM, AND THE LIKE. WELL, THAT'S DROPPED BY 11 PERCENT, AND IT'S LIKELY TO DROP MORE.

MOREOVER, IT'S NOT JUST THE VISIBLE COMPENSATION THAT THEY RECEIVE IN THEIR PAYCHECK THAT'S ERODED SIGNIFICANTLY. IT'S THE NONCASH COMPENSATORY INCOME THAT WAS USED TO PROVIDE VERY LOW-COST RECREATION ON BASE THAT THEY DIDN'T HAVE TO PAY FOR OUT OF POCKET. WE USED TO PROVIDE FREE REPAIR FACILITIES FOR THEM TO WORK ON THEIR CARS OR WORK ON THINGS FOR THEIR HOME. THEY NOW PAY FOR THAT AT INCREASINGLY HIGHER RATES. THEY HAVEN'T BEEN COMPENSATED FOR THAT. IN OTHER WORDS, YOU'VE GOT PAY AND NONPAY COMPENSATION. WE ARE NOT TREATING THEM AS THEY EXPECTED TO BE TREATED.

WHAT DO THEY DO EVENTUALLY? THEY VOTE WITH THEIR FEET. THAT'S WHAT THEY ARE DOING TODAY. WE ARE LOSING PILOTS AT AN EXTRAORDINARILY HIGH RATE. WE'RE LOSING NAVIGATORS. WE'RE LOSING ENGINEERS AND WE'RE LOSING OUR ENLISTED PEOPLE. WHAT WE LOSE IS REPLACEABLE AS LONG AS WE CAN KEEP ATTRACTING YOUNG PEOPLE. IT COSTS ABOUT $5 MILLION TO TRAIN A PILOT. IT

WOULD COST A FEW HUNDRED DOLLARS A MONTH TO RETAIN HIM. WHEN WE THROW AWAY THAT $5 MILLION, WE ALSO THROW AWAY, IN THE PRESENT CASE, ABOUT EIGHT YEARS OF EXPERIENCE AND WE REPLACE IT WITH INEXPERIENCE. LIKE ANY BUSINESS OR ENTERPRISE THAT RELIES ON MANAGEMENT AND LEADERSHIP, WE NEED THAT EXPERIENCE. SO I WOULD ASK THAT YOU THINK OF THESE YOUNG PEOPLE WHEN YOU TALK TO YOUR REPRESENTATIVES.

I WOULD LEAVE YOU WITH ONE LAST THOUGHT. IT'S ONE OF MY FAVORITES AND I THINK IT SAYS IT ALL. IN HIS INAUGURAL ADDRESS, PRESIDENT KENNEDY ADDRESSED THE NATION AND SAID, "AMERICA CAN AFFORD TO BE STRONG, SHE CANNOT AFFORD TO BE WEAK. WE'LL DO WHATEVER IS NECESSARY TO MAKE AND KEEP HER STRONG." AND HE DID. AND WE HAVE. WHEN YOU STOP AND THINK ABOUT IT, WE CAN AFFORD TO BE STRONG; WE CAN'T AFFORD TO BE WEAK. WE NEED TO DO WHAT IS NECESSARY TO MAKE AND KEEP AMERICA STRONG. I WOULD ALSO ADD WE NEED TO HAVE A STRONG ECONOMY BECAUSE THAT'S THE ONLY WAY TO KEEP HER STRONG. GOD BLESS YOU ALL FOR WHAT YOU DO TO KEEP AMERICA STRONG.

CONGRESSIONAL TESTIMONY

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Statement
on
Space Control

by

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STATEMENT FOR THE RECORD

HOUSE ARMED SERVICES COMMITTEE
(RESEARCH AND DEVELOPMENT SUBCOMMITTEE)

HEARING ON SPACE CONTROL

I. INTRODUCTION AND OVERVIEW

Mr. Chairman, distinguished members of the Committee, I very much appreciate the opportunity to appear before you today in my capacity as the Commander in Chief of the joint service, unified United States Space Command (USSPACECOM), and to share with you my views on the subject of space control. My thesis is straightforward: our country needs to develop a credible operational space control capability at the earliest possible date.

In the course of these remarks, I intend to describe the space control mission and the numerous space surveillance systems and activities which contribute to it. In addition, I will describe needed improvements to these systems and underscore the urgent need for a U.S. antisatellite, or satellite negation capability. Because the Congressional Moratorium against testing an antisatellite system in space has contributed to impeding development of this critical capability, I will also examine some of the arguments used to support the moratorium. Throughout, I will highlight some of the more significant Soviet military space capabilities.

Although my remarks today will focus on the need for a more robust space control system, it should not be construed that this is the only military space need our nation has. While our operational military space capabilities are adequate in peacetime, they are less than equal to the demands that would be imposed by simultaneous contingencies in different parts of the world, or by a crisis which directly places the interests and military forces of the United States in opposition to those of the Soviet Union.

In these latter cases, we would currently be challenged to meet the needs of our National Command Authorities and warfighting forces for an increase in on-orbit capability--communications support, surveillance, warning, environmental sensing, and navigation support services. Added capability requires more on-orbit assets, more robust satellite constellations. There are essentially two ways of satisfying these needs: by more on-orbit capability--including operational spacecraft and on-orbit spares--routinely maintained in peacetime; or by a strategic ground reserve of replacement or substitute satellites and boosters that could be launched quickly to increase or rapidly replenish on-orbit capability during contingencies or a crisis. Our space forces also require the ability to endure.

Endurability is provided by a force structure--satellites, boosters, launch facilities, and control elements--large enough to be less sensitive to single-node or catastrophic failure, or to enemy action, and possessing sufficient survivability enhancements to ensure functional survivability. In the case of spacecraft, the nature of these enhancements is determined by the mission of the spacecraft, the particular orbit in which it operates, and its potential vulnerability to the range of threats it might face. Among these enhancements are on-board satellite attack warning systems, hardening against nuclear effects, security of uplinks and downlinks, jam-resistance, protection against directed energy attacks, manuverability, and increased satellite autonomy.

In the case of the ground-supporting satellite control and data distribution infrastructure, this means enhancements such as improved site security, mobility, proliferation, hardening, and, where appropriate, the direct downlink of data to the tactical user.

Finally, we need the ability to negate the war-supporting spacecraft of an adversary. Admittedly, that will not be an easy task. The Soviet launch infrastructure is the largest and most responsive in the world. It enables them to sustain a large on-orbit population of spacecraft and to rapidly increase or replenish their space order of battle. While more than adequate for Soviet needs in peacetime, Soviet military space capabilities are clearly designed to achieve space superiority in a crisis or conflict. Even in peacetime, their space capabilities are impressive.

The number of satellites the Soviets maintain on orbit has increased from about 120 in 1982 to about 150 in 1987, with this total as high as 160 in early 1986. The Soviets are currently placing about 40 percent of their space systems in deep space, and deep space is an area where we have a significant shortfall in our surveillance coverage.

Most Soviet space systems are on orbit to provide warfighting support to their land, sea, and air forces. Simply stated, their function is to significantly increase the risk facing U.S. and Allied soldiers, sailors, airmen, and Marines in combat. Thus, I believe--and hope to show you--that this nation and the military personnel who defend it require and deserve highly capable space control systems, including an operational antisatellite capability.

I hope to also demonstrate that a failure on our part to acquire and deploy a space control system that includes antisatellite capabilities undercuts deterrence, presently denies us the capability to respond-in-kind to Soviet antisatellite attacks, and virtually gives the Soviets a guarantee that their space systems can operate freely in space during conflict, while our own would likely be rapidly diminished as they became subjected to vigorous antisatellite attacks.

Your United States Space Command--with its Army, Naval, and Air Force component commands--was created to become the focal point for integrating those military space capabilities of our country that contribute to deterrence and to warfighting. We are also charged to be the advocates for required improvements to operational military space capabilities. With those thoughts in mind, I will proceed to describe our assigned responsibilities.

II. USCINCSPACE RESPONSIBILITIES

Our national security policy is based on the principle of deterring wars at any level rather than fighting them. For deterrence to work, it must be credible. For deterrence to be credible, an adversary must clearly recognize that he cannot achieve his objectives by resorting to armed conflict. Our national military strategy requires highly capable, forward-based land, naval, and aerospace forces. It also requires robust central reserves which are able to rapidly reinforce these forward-deployed forces. Highly capable and fully modernized nuclear forces also extend deterrence beyond the spectrum of conventional conflict.

Today, our forces are based around the globe and on the high seas far from the United States and are, therefore, heavily dependent on the communications, navigation, and surveillance and warning services provided by a comparatively small, but highly capable and absolutely vital force structure of space-based systems.

To ensure that space forces contribute to the general military capability of the United States, USCINCSPACE has been assigned the broad missions of surveillance and warning, the planning and requirements development responsibilities for ballistic missile defense, and the responsibility for space operations, which includes both space support and space control activities.

II A. SURVEILLANCE AND WARNING

The surveillance and warning mission encompasses three functions. These are: supporting NORAD with the missile warning and space surveillance information necessary to fulfill the U.S. commitment to the NORAD Agreement; providing support as necessary to commanders in chief having ballistic missile and space attack warning requirements for areas other than North America; and, should NORAD become dysfunctional for any reason, providing the U.S. National Command Authorities with integrated tactical warning and assessment of a space, missile, or air attack against the United States.

II B. BALLISTIC MISSILE DEFENSE PLANNING

The Joint Chiefs of Staff have by means of the Unified Command Plan assigned USCINCSPACE the responsibility to plan for and to develop operational requirements for the mission of engaging attacking ballistic missiles during strategic conflict. The responsibility for planning and developing requirements should not be confused with the responsibilities of the Strategic Defense Initiative Organization (SDIO). SDIO is responsible for researching advanced defensive technologies which could be used to defend against ballistic missile attacks. USSPACECOM has no technology research responsibilities in this area.

II C. SPACE OPERATIONS

Space operations include space support activities and the space control mission. Space support activities can be best understood as "combat support," as opposed to "combat" activities. Combat support activities include supporting the launch and on-orbit requirements of other commanders in chief and operating assigned and designated force-enhancing space systems. Combat activities, specifically the space control mission, are also included in space operations.

III. FOUNDATION FOR SPACE CONTROL

III A. NATIONAL SPACE POLICY

The space control mission has its genesis in military necessity and national policy. A new National Space Policy directive was signed by President Ronald Reagan on 5 January 1988, and clearly states that one of the basic goals of the United States in space is to strengthen the national security. Our nation is committed to the use of space for peaceful purposes, including the pursuit of national security goals and the right of self-defense. This includes the conduct of national defense activities required to deter and defend against attack, and those activities required to enhance U.S. and Allied military operations if deterrence fails.

III B. DEPARTMENT OF DEFENSE SPACE POLICY

The DOD Space Policy, issued on 4 February 1987, recognizes space as a medium to conduct operations in support of our national security. It specifically describes the space control mission as consisting of the functions of satellite negation and satellite protection, including having the capability to monitor and assess all militarily significant activities in space. It states that the DOD will develop and deploy an antisatellite capability with initial operational capability at the earliest possible date.

III C. SPACE CONTROL OPERATIONS

The employment of forces in space control operations represents a combat or warfighting mission assigned to USCINCSPACE. These space control forces must have the capability, across the spectrum of conflict, to carry out the functions of detecting space objects, identifying their activities as either threatening or nonthreatening, assessing the capability and possible intent of each foreign system, and engaging or nullifying those that are the war-supporting space systems of an enemy. This latter requirement is defined in JCS Multi-Command Required Operational Capability (MROC), SM 77-88, 5 February 1988, the unclassified portions of which I will discuss later.

III D. ANALOG TO SEA CONTROL OPERATIONS

Space control, not unlike sea control for maritime operations, hinges on the ability to enforce our nation's right to safe passage. Space control operations help ensure the ability to conduct friendly operations in space, and--when necessary and directed by the National Command Authorities--to deny an adversary the use of those space systems which support hostile military forces. Negation or denial operations, however, cannot be undertaken without the support of a space surveillance system.

IV. SPACE SURVEILLANCE AND SATELLITE PROTECTION

The space control mission assigned to USCINCSPACE inherently requires the ability to maintain an accurate, timely space orbital data base. Our Space Surveillance Network is a national asset. It detects and tracks all man-made objects in space not only for DOD, but for NASA and commercial users as well. A timely and highly accurate space data base is an essential prerequisite for many of this command's activities: satellite attack warning, threat surveillance and predictions, and the compilation and maintenance of an accurate space order of battle data base. The data provided by our space surveillance sensors is also used by the U.S. intelligence community for detailed analysis of foreign space systems and capabilities.

IV A. SPACE SURVEILLANCE NETWORK

Our space surveillance sensors were not originally designed or intended to function as a network. Over time, however, operational requirements and technology were combined in such a way that an integrated network or system evolved. Today the sensors operated by USCINCSPACE's Army, Naval, and Air Force components include electro-optical telescopes, phased array and mechanical tracking radars, radio receivers, and specialized deep space radars. The command employs twenty-seven assigned sensor sites worldwide. Only ten of these sensors have space surveillance as a primary mission. The remainder have as their primary mission either missile warning, intelligence collection, or they are leased civil or commercial sensors.

The network is a predictive system and does not provide continuous monitoring of space objects. Consequently, there are exploitable gaps in our surveillance coverage both in near earth and deep space. These coverage gaps currently limit our ability to accomplish many of the time-sensitive missions dependent on rapid and accurate observations and surveillance data. Launch of a Soviet space shuttle with the ability to insert payloads into orbit will complicate the space surveillance task, if satellite insertions exploit the surveillance gaps that exist. In addition to coverage gaps, the current network does not provide adequate radar imagery of satellites or satellite signature data.

IV B. RADAR IMAGERY AND SURVEILLANCE SIGNATURES

While eighteen of our twenty-seven sensors provide satellite signature data, eleven radars provide only low quality, narrow-band time and amplitude data. In addition, six optical sensors--which are essentially limited to night time, clear weather operation--also provide optical time and amplitude data. There are only two radars capable of providing all weather, day and night, high quality wide-band radar images. As a result, high quality radar imagery of satellites often cannot be obtained as a space event occurs. Data from all the sensors is transmitted to the interactive Space Surveillance Center.

IV C. SPACE SURVEILLANCE CENTER

The USSPACECOM Space Surveillance Center is the operational command facility which manages and tasks the Space Surveillance Network, compiles and maintains the space catalog, and provides orbital support predictions to military and civilian consumers. The center computes when an object will enter a particular sensor's field of view, tasks sensors to track orbiting objects, uses sensor observations to update the space catalog and generate subsequent taskings, and continually monitors the space environment for any change resulting from launches, maneuvers, or other space events.

This process is supported by a 1970 vintage computer system which is tasked to accomplish the processing and prediction of 60,000 daily tracks on more than 7,000 orbiting objects. As the number of objects in space continues to grow, considerable stress is being placed on the capacity of our current computer system. The Space Surveillance Center also directly supports the command's Joint Space Intelligence Center and Space Defense Operations Center.

IV D. JOINT SPACE INTELLIGENCE CENTER

The Joint Space Intelligence Center was created to employ space intelligence resources and all source intelligence information to determine the status of foreign space systems. It also performs operational analysis on sensor signature and imagery data as part of the mission and payload assessment task. Mission and payload assessment allows USCINCSPACE to evaluate the potential threat posed by a foreign satellite. For example, the center enables

USCINCSPACE to identify Soviet military satellites and to warn our forces of vulnerability to their overflight. Mission and payload assessment also enables our country to monitor compliance with the United Nations treaty prohibiting weapons of mass destruction in space. Operational analysis of signature and imagery data and intelligence are also used to determine the kind or extent of any damage sustained by a satellite payload. For example, determining whether a satellite may have collided with space debris or may have been the victim of a deliberate attack. The Joint Space Intelligence Center interacts with both the Space Surveillance Center and the Space Defense Operations Center to protect friendly satellites from potentially hostile acts.

IV E. SPACE DEFENSE OPERATIONS CENTER

The Space Defense Operations Center maintains the current operational status of friendly and foreign space systems on orbit. It is essential that we maintain accurate data on all aspects of each of our space systems, including the on-orbit satellite itself, the satellites' communication links to the ground, and the status of the ground control sites that command various spacecraft. We also monitor the space systems' capability to respond to a hostile event. The current status of each of these elements is maintained on military, civil, and commercial space systems of the United States. The functions performed by these centers are so critical that alternate centers must also be maintained.

IV F. ALTERNATE SPACE CENTERS

In addition to the primary Space Surveillance and Space Defense Operations Centers located within the Cheyenne Mountain Complex at the Air Force Space Command's Cheyenne Mountain Air Force Station, we maintain an alternate location for both of these centers. The Alternate Space Surveillance and Alternate Space Defense Operations Centers are located at the Naval Space Command in Dahlgren, Virginia. While these alternate centers are austere, they provide an essential capability including vulnerability reporting which we routinely exercise to ensure the ability to perform critical functions in the event that operations in the primary centers are disrupted.

IV G. SATELLITE ATTACK ASSESSMENT

The space control resources identified above support the command's mission of providing freedom of action in space for friendly forces. Should a potentially threatening event be detected, an assessment must be quickly made in the Space Command Center--USCINCSPACE's Command Post--to determine if friendly space resources are at risk. This assessment is made by me or by a senior military officer certified by me, and requires comparative analysis with the existing space surveillance data base, analysis of all source intelligence data, and direct coordination with the owners or operators of potentially threatened space systems. This process allows USCINCSPACE to assess the likelihood that an attack is about to occur, is in progress, or has already occurred. The resultant product of the assessment process is the rapid notification to space system owners or operators, unified and specified commanders, and the National Command Authorities that an attack is imminent or has occurred. Because the accuracy and the timeliness of surveillance sensor observations determines the quality of the Space Surveillance Center's space object catalog, both the sensors and the catalog are essential prerequisites for a timely and accurate space attack assessment. The objective of all these centers and the activities which support them is ultimately the protection of friendly spacecraft.

IV H. SATELLITE PROTECTION

Few people seem to be aware that the Soviet Union has the world's only operational antisatellite (ASAT) systems. These uncontested Soviet capabilities are real, and present a threat to U.S. and Allied space systems. Today, we have very limited and only passive means of protecting our critical space systems. Once a possible threat event is detected, the operator of the potentially threatened system is notified that his satellite is vulnerable, and defensive measures such as maneuvers are recommended. However, few of our current satellites have the capability to perform defensive maneuvers. Additionally, maneuvers consume fuel and satellites are not launched with an unlimited amount of maneuvering fuel on board.

To accomplish the "protection" portion of the space control mission, we require a mix of capabilities that provide warning and detection of hostile or potentially hostile acts against U.S. satellite systems. New satellite systems are being designed and developed with improved survivability enhancements, including hardening, redundant components, proliferation, and increased maneuvering capability. It must be emphasized, however, that our current ability to detect, deter, or defend against a direct threat against our space systems is extremely limited. Whether our country decides to develop a credible, operational antisatellite system or not, future U.S. force-enhancing space systems must be designed, developed, and operated to enhance their survivability and endurability across the spectrum of conflict.

It is important to understand that our nation's military space capabilities comprise an interrelated, highly interactive **system**, although the separate elements were not originally developed as a **system**. Nonetheless, the separate elements that now comprise the system can no longer be viewed in isolation. Spacecraft maneuver capability as a defensive measure, for example, is of little utility if the network designed to identify the need for and command its maneuvers is fragile. Similarly, highly survivable satellites and highly survivable ground sites are of little use if the uplinks to the satellites are not secure, or if they are vulnerable in some other way.

The interdependence of all the elements in the system mandates that we evaluate separate elements in terms of their importance to the **overall** system. Great care is required to ensure that each link in the chain is improved and that no single link is neglected. However, there are limits to the survivability we can build into our space systems. In the final analysis, it is deterrence that provides the greatest survivability. Viewed in this light, satellite negation capabilities are an essential complement to satellite protection capabilities.

The satellite "negation" activity within the space control mission will be addressed after an examination of Soviet space control capabilities and the Congressional Moratorium against testing a U.S. antisatellite or satellite negation system against objects in space. The former is critical to understanding the need for a U.S. satellite negation capability. The latter has contributed to impeding development of this needed capability.

V. SOVIET CAPABILITIES

Soviet military space doctrine holds that control of space is a prerequisite for Soviet victory on land, at sea, and in the air. To fully understand the importance of the space control negation mission, an understanding of Soviet space control and antisatellite capabilities is necessary.

Soviet space control forces include ground, sea, and space-based assets. These elements provide command and control of Soviet satellites throughout their lifetime. Ground centers include both fixed and mobile ground support facilities, and, additionally, some Soviet ships which provide instrumentation and satellite command and control.

The Soviet Union also has at its disposal multiple and diverse antisatellite systems or technologies, including co-orbital satellite interceptors, direct ascent antiballistic missiles capable of satellite interceptor operations, high energy lasers, and probably electronic warfare systems.

Directed energy weapons and electronic warfare capabilities would provide the Soviets considerable advantages, especially at the lower levels of conflict. Attacks by such weapons might be difficult to detect and harder to confirm. The outcome could be a slow degradation in capability, or the disruption of some satellite functions without the prompt physical destruction of the spacecraft. It should be no surprise that Soviet operational analysis has led them to seek development of a family of antisatellite systems that could be employed across the spectrum of conflict.

V A. CO-ORBITAL ASAT

The Soviets began testing the SL-11 launched co-orbital antisatellite system during the mid-1960s. It became and has remained operational since 1972. The antisatellite system is launched from Tyuratam, the world's largest space launch facility, into an orbit that is in the same plane as the target satellite. The target satellite is destroyed when the Soviet interceptor satellite closes on the target and explodes a conventional, multi-pellet warhead. Tyuratam has numerous launch pads and enough storage area to accommodate a substantial number of antisatellite boosters and interceptor payloads. The Soviet co-orbital antisatellite poses a considerable threat to U.S. low altitude satellites. The co-orbital antisatellite may not feature exotic techonology, but it does provide substantial space combat capability, and as I mentioned, is fully operational.

In August 1983, the Soviets declared what they called a unilateral moratorium on further antisatellite testing. Consequently, the Soviets have not conducted fully integrated testing of their entire co-orbital antisatellite system since 1982. However, the SL-11 booster which is used to launch the co-orbital antisatellite has continued to successfully launch other payloads since then. There would be nothing to preclude them from having tested other components of the system--short of impacting an object in space--separately.

V B. DIRECT ASCENT GALOSH

In addition to the co-orbital antisatellite, the Soviets have deployed a significant number of antiballistic missiles which have inherent antisatellite capabilities. The likelihood that the Soviets would employ direct ascent weapons against our satellites cannot be dismissed. The threat posed by direct ascent antisatellite weapons is at least as serious as the threat posed by the SL-11 co-orbital satellite interceptor. The Soviets, however, have not relied on kinetic kill technologies, or impact weapons alone to hold our spacecraft at risk. They also have significant potential capabilities residing in directed energy weapons.

V C. DIRECTED ENERGY

Soviet directed energy capabilities have progressed, in some cases, beyond technological research and could be developed for antisatellite use within a very short period. The Soviets have devoted considerable research to the pulsed-power techniques which are applicable not only to lasers, but also to radio frequency and particle beam weapons. At Sary Shagan alone, the Soviets are estimated to have two lasers probably capable of damaging components of satellites in orbit. The longitudinal spacing of the co-orbital satellite interceptor launch facility at Tyuratam and the laser facility at Sary Shagan ensure that critical U.S. low-altitude satellites would come within range of these threatening systems each day. We believe the Soviets could also deploy space-based lasers for antisatellite purposes in the 1990s. An airborne laser prototype system could also have an antisatellite capability in the near term.

V D. RADIO FREQUENCY

Recent Soviet developments in radio frequency (RF) energy generation have significant potential applications for a fundamentally new type of weapon that could degrade spacecraft electronics. The Soviets have generated single RF pulses in the research environment with a peak power exceeding one billion watts, and repetitive pulses of over 100 million watts. If they choose to develop a weapon system based on this technology, no significant technological obstacles stand in the way of a prototype radio frequency weapon with antisatellite applications by the 1990s.

V E. PARTICLE BEAM

Extensive research and development efforts--with military interest and support--in technologies applicable to particle beam weapons have been evident since the early 1960s. The Soviets may be able to test a prototype space-based particle beam weapon intended to disrupt the electronics of satellites during the 1990s.

V F. LAUNCH

Soviet space launch vehicles are, contrary to popular belief, extremely reliable, as evidenced by their average launch rate of nearly 100 space launches each year. The Soviets have nine operational space launch vehicles with another under development. Their newest launch vehicles are the medium-lift SL-16, and the heavy-lift SL-X-17 boosters. It should be cause for concern that estimates by the Defense Intelligence Agency indicate that during the next four years the Soviets could double their current weight-to-orbit capability. Today they have ten times as much lift capacity as we do. It is estimated that by the year 2005, the Soviets will quadruple their launch capacity, thereby exceeding their estimated requirements by nearly two million pounds annually. The U.S dollar equivalent cost to the Soviets for this excess lift capacity is staggering. The payloads to be orbited with this excess launch capacity have not yet been identified, but past Soviet practice strongly suggests they will most likely be military payloads, and that is cause for concern.

Their launch surge capability, to which I alluded earlier, is also militarily significant. They have demonstrated the ability to get a large number of spacecraft operating on orbit very quickly, and have employed this capability in their military exercises, during real-world contingencies, and to cope with unexpected failures of their own satellites. Perhaps the best example of their surge capability was provided during the Falkland Islands crisis in 1982. During a 69-day period, the Soviets conducted 28 space launches. Although not all of the launches were stimulated by the crisis, it does serve to demonstrate the reliability and responsiveness of the Soviet space launch system. It should also be noted that this surge capability has improved since 1982.

The Soviet's long term commitment to space was reaffirmed by General Secretary Gorbachev in May 1987 at the Tyuratam Space Center, prior to the first test launch of the new heavy-lift SL-X-17 space booster. He said, "We do not intend to relax our efforts and lose our vanguard position in the conquest of space." This "vanguard" position--and whatever that may mean to the Soviets--will be maintained as long as the United States lacks a robust space control capability. Achieving a credible operational space control capability is made more difficult by the Congressional Moratorium prohibiting the testing of an anti-satellite system against objects in space.

VI. ANTISATELLITE TESTING MORATORIUM

In arguing for the continuation of an antisatellite testing moratorium, advocates of the moratorium have reasoned that the current situation is to the advantage of the United States, even though the Soviets already have an operational antisatellite system and we do not. Their basic argument is based on several key assumptions, which must be examined in formalizing a coherent U.S. policy regarding development and testing of U.S. space control satellite negation systems.

Moratorium advocates have asserted that the United States is far more dependent upon its satellite systems than the Soviet Union. Therefore, in a situation where both the United States and the Soviet Union possessed effective antisatellite systems, they argue that the United States would be at a disadvantage because of its greater dependence on satellite systems.

If it is believed that it is we who are the most dependent on space-based systems, it would seem to me that our primary objective should be to do everything possible to protect those high-value assets by deterring attacks against them. We do not contribute to that goal by allowing the Soviets a unilateral antisatellite advantage.

We and the Soviets both depend heavily on space systems for such key functions as communications, missile launch detection, navigation, surveillance, and environmental monitoring. The Soviets have thoroughly integrated these vital space support functions into all aspects of their operational planning, and their peacetime as well as wartime military operations. While both our nations have capitalized on space and space-based systems to support and enhance the effectiveness of terrestrial and maritime forces, Soviet naval operations are particularly dependent on space-based capabilities.

The Soviets maintain satellites in orbit to provide timely targeting information against our forces. The Soviets have systems such as the Radar Ocean Reconnaissance Satellite (RORSAT) and the Electronic Ocean Reconnaissance Satellite (EORSAT) for which the United States has no counterpart. The mission of the RORSAT and EORSAT is to attempt to offset the advantage we have in our naval forces by detecting and locating U.S. and Allied naval forces, and then providing targeting data to Soviet combatant platforms armed with long range standoff weapons.

The Soviets also continue to improve their already impressive space-based photoreconnaissance capabilities. While the Soviets have maintained terrestrial alternatives to some space systems, they fully recognize that the speed, accuracy, and wide area surveillance capabilities of space systems are superior when it counts the most--during wartime. Having recognized their importance, the Soviets have developed and maintain a space launch infrastructure which also gives them the capability to rapidly reinforce their space order of battle, especially their highest value surveillance and targeting spacecraft.

Any U.S. antisatellite program must be directed in the near term at negating those low-altitude Soviet satellites which most threaten U.S. and Allied terrestrial and maritime forces in times of crisis or conflict. In the final analysis, we have the most to lose by conceding the use of space to the Soviets. A U.S. antisatellite system would be a valuable adjunct to other deterrent forces designed to increase the risk of Soviet adventurism in other media.

We often hear the assertion that the moratorium provides or guarantees equilibrium, with neither country having an effective antisatellite system. We are told that the Soviet system is a rudimentary device, based upon 1960s technology, and does not represent a significant threat to the U.S. space systems. These assertions do not square with the facts.

From an operational military viewpoint, the moratorium continues to preserve a significant advantage for the Soviets. In the Soviet view, military superiority in space is achieved by complementing the successful employment of their own satellite systems to support Soviet military operations with the use of Soviet antisatellite systems to degrade or destroy U.S. spacecraft. The Soviet Union is fully aware of the strategic importance of military satellites to the United States and the severe impact their loss would have on U.S. military capability.

Many also view the Soviet antisatellite threat as one-dimensional. It is not. The Soviets possess, as stated earlier, diverse and complementary antisatellite capabilities, including directed energy systems and direct ascent antiballistic missiles which could be employed in an antisatellite role. Further, the Soviets have the technical capability to employ electronic warfare systems and radio-electronic combat techniques against our space-based systems. These latter operations are absolutely compatible with Soviet military doctrine and have recently been discussed openly by the Soviets as having high utility against our spacecraft.

But even if the threat were one-dimensional and resided solely in the co-orbital antisatellite system, it is still not prudent to take comfort in the judgment that the system would be ineffective because the technology is simple or crude. Nor is it prudent to accept Soviet assertions that since the system has not been tested in space since 1982, it could not be employed with confidence. On the first point, we have failed to consider the possibility that "crude" or "simple" technology may be perfectly adequate, especially in wartime. We should avoid falling into the trap of judging Soviet systems by our own high technological standards. On the second point, the Soviets have used the SL-11 booster which launches the co-orbital antisatellite on numerous occasions since 1982. It has proven to be an almost perfectly reliable system. Further, we cannot be certain that the Soviets have not continued to test antisatellite systems or components separately, or in other than an operational environment. Clearly, launch crews and satellite operators can rehearse operational procedures to maintain their combat readiness without actually launching or commanding spacecraft. In short, Soviet antisatellite systems represent real military capability, and there is no reason, no logic to even suggest the Soviets would not employ them fully in the event of conflict.

Antisatellite testing critics have also argued that continued testing of any U.S. potential antisatellite system would be destabilizing. The Soviets, they argue, would be stimulated to improve their "rudimentary" system. Eventually, an escalating antisatellite "arms race" would lead to a situation where both countries had effective systems, which proponents of this view maintain would be to the disadvantage of the United States.

From our perspective, it is the current situation which is dangerously destabilizing. Given that the Soviets and the U.S. would both be highly dependent upon their low-altitude satellites even during limited war, deterrence is not enhanced if the Soviets can depend on their own space systems and, at the same time, negate or degrade our own vital ones.

If deterrence fails for whatever reason, our lack of an antisatellite places us at a distinct disadvantage. Our military war games have repeatedly revealed what should be obvious: that--lacking a U.S. satellite negation capability--after an antisatellite attack upon our space systems, we are left with a narrow range of choices to deter further attacks upon our space assets. If we did nothing and the Soviets continued to attack our space assets, our forces would be at an extremely serious military disadvantage. If we elected an asymmetric response, under some conditions, this retaliatory response could quite possibly be misinterpreted by the Soviets and result in a further escalation of the conflict.

An operational antisatellite capability against Soviet satellites would increase deterrence, and if deterrence failed, would provide an unambiguous in-kind response which would reduce the risk of unintentional escalation.

Proponents of the moratorium have also argued that it--in conjunction with the Soviet's self-imposed "restraint"--constitute a kind of arms control initiative, and prevent an extension of the "arms race" into space. I can think of little that is less binding on the Soviets than a self-imposed moratorium, although the perception that they have restrained themselves clearly has had high political utility for them.

A final assertion made by moratorium advocates is that antisatellite testing has a dangerous collateral effect in that it creates space debris. They assert that antisatellite tests have been a major contributor to the growing hazard of collisions in space.

Space debris caused by antisatellite testing should be and is a serious concern when devising antisatellite tests. We do not want to unnecessarily endanger our own or other countries' space systems during peacetime testing. Therefore, a rigorous orbital analysis is completed prior to each test. If the analysis indicates a significant potential increase in the space debris hazard, the test is replanned.

The Air Force has developed a target--an instrumented test vehicle (ITV)--which significantly reduces space debris resulting from antisatellite testing. ITVs have less than one-tenth of the mass of the previously used target, and the fewer pieces of debris generated by an intercept fall from orbit in a matter of days. Research is continuing to devise antisatellite testing procedures that could not only minimize debris, but could also accelerate the decay process.

It is my judgment that continuing the moratorium against testing an antisatellite system in space does not serve the national security. Deterrence is not enhanced by allowing the Soviet Union the world's only operational antisatellite capability. I would not suggest that we "mirror image" the Soviets by attempting to match them gun for gun or bullet for bullet. I would, however, assert that we must not concede to them a unilateral advantage in any operational medium--land, sea, air, or space. Because an antisatellite testing moratorium has prevented the Department of Defense from completing the normal development cycle prerequisite to declaration of operational capability, it--more than anything else--has impeded us from acquiring a validated, much-needed military capability. It would be just as inadvisable to declare a satellite negation capability operational without fully testing it, as it would be to go into series production of a tank, or a fighter, or a submarine without proper testing. While we are and must be clearly submissive to the will of the American people as it is expressed by our elected representatives, my responsibilities as a military commander require that I urge we consider the potential negative impact of continuing the moratorium on our national security.

VII. SPACE CONTROL REQUIREMENTS

VII A. AUTHORITY

In July 1982, President Reagan announced a National Space Policy which set the direction for United States efforts in space. A key element of this policy was the direction to strengthen the security of the United States by developing "an antisatellite capability, with operational deployment as soon as possible." Again in January 1988, President Reagan signed a new National Space Policy which reaffirms that our nation is in space for peaceful purposes, that those purposes include the pursuit of national security objectives and the right of self-defense.

The two aspects of the Soviet space program which affected our security in 1982, endure today: the Soviets have the ability to destroy U.S. satellites; and, the Soviets have the ability to use satellites for surveillance and targeting of U.S. and Allied air, land, and sea forces.

VII B. SATELLITE NEGATION

The ability of the United States to deploy and employ its military forces worldwide is increasingly dependent on the freedom to operate in space. Most of our satellite systems are critical to worldwide land, sea, and air operations. Their availability is planned and expected throughout the spectrum of conflict. Yet, as I have tried to show, the United States has no capability--beyond the general military capability provided by our terrestrial and maritime deterrent forces--to protect our space systems from attack by enemy antisatellite weapons, or to deny an adversary the wartime use of space to support his terrestrial forces. Of the space-faring nations in the world today, the nation that has clearly designed its space forces to support and sustain combat operations is the Soviet Union.

U.S. space control systems, including an antisatellite capability, are required so that our country can possess the capability to disrupt, degrade, or destroy threatening space systems, or systems that support enemy operations.

In view of the importance of our space assets, and the continued need to project power to deter war and control escalation during conflict, it is essential that the United States develop and deploy an operational antisatellite system to deter the Soviets from exploiting their present antisatellite and space-based targeting capabilities.

VII C. ANTISATELLITE REQUIREMENTS

The Commander in Chief, U.S. Space Command, is assigned the mission of conducting those space control operations. Space control operations require the ability to actively and passively defend friendly space systems against a wide variety of threats. They also require the ability to disrupt, degrade, or destroy the warfighting capabilities of enemy space systems.

Forces employed in support of space control operations or performing satellite negation require the ability to carry out, across the spectrum of conflict, the functions of detecting objects and activities on the earth's surface and in the aerospace, identifying these objects or activities which are threats, assessing their capability and possible intent, and attacking or nullifying enemy warfighting or war-supporting systems that operate in space. Accomplishment of these operational functions requires a combination of highly capable surveillance and command and control systems, as well as a family of adequately tested engagement capabilities.

VII D. SPACE SURVEILLANCE IMPROVEMENTS

Given the gaps in our coverage capability and the rapidly growing number of objects in space which we must track, substantial improvements to the current space surveillance network are required. Future Space Defense Operation Center upgrades include a new, more capable computational and tracking system. A Deep Space Surveillance Radar is now essential for adequate coverage of a portion of the geosynchronous band which is populated by a growing number of Soviet military spacecraft. This surveillance radar must provide real-time deep space tracking and high quality wide-band imagery data. Negotiations with the Government of Portugal for the construction and operation in Portugal of the fifth and final Ground-Based Electro Optical Deep Space Surveillance System continue. Finally, construction has just begun on Saipan for a radar which will eliminate an important gap in our coverage over the Pacific Ocean. This radar will provide vital data on new Soviet spacecraft within hours of a launch.

In the long term, a space-based space surveillance system is required to fill remaining near earth coverage gaps and to provide time-sensitive satellite attack warning. This requirement was validated in the early 1970s and pursued by the Air Force until 1984, when responsibility for development of a space-based surveillance system was turned over to the Strategic Defense Initiative Organization. It is now referred to as the Space Surveillance and Tracking System, and must be developed to meet the needs posed by any future ballistic missile defense system along with the long-established requirement for space surveillance in support of satellite protection.

VII E. JOINT CHIEFS OF STAFF VALIDATED REQUIREMENTS

The Joint Chiefs of Staff have validated a Multi-Command Required Operational Capability (MROC, SM 77-88) for a space negation system. This document requires that we build a force structure that will eventually provide a satellite negation capability at all of the altitudes where hostile space systems operate.

In the near term, a capability to engage targets in low-earth orbit is vital to deter aggression and to contribute to our national security. In the mid and far terms, a mix of negation systems must provide the capability to engage enemy spacecraft at all altitudes. Such a family of systems would most likely be composed of kinetic kill vehicles, directed energy systems, and electronic warfare capabilities. This mix of systems will provide the National Command Authorities and USCINCSPACE with a range of capabilities and employment options, including the capability to degrade or disrupt the operations of enemy spacecraft, or the prompt or delayed destruction of the spacecraft themselves. The use of "soft-kill" techniques in the areas of directed energy , for example, could have extremely high utility in a low-level crisis situation, while also providing the capability to destroy enemy spacecraft at higher levels of conflict. The "hard-kill" or kinetic kill systems would most likely be utilized at higher levels of conflict to promptly and overtly negate a threatening system.

The antisatellite weapon systems comprising the satellite negation force structure should be compatible with the existing or planned USCINCSPACE command and control systems, and the existing or planned interfaces with the National Military Command System. The command control system must provide the National Command Authorities and USCINCSPACE the capability to effectively direct antisatellite operations, while at the same time providing essential information to terrestrial and maritime forces on the status of hostile space systems and activities. In view of the importance of our space assets, and the continued need to project power to deter war and control escalation during conflict, it is essential that the United States begin to develop and deploy an operational satellite negation system immediately.

VIII. PEOPLE

I would be remiss in my responsibilities if I did not also say a word about people. Secretary of Defense Carlucci rightfully made our "people" a top priority when he presented the Department of Defense's budget submission to Congress. People are our top priority.

As we enter an era of even more austere funding, I urge that we recognize their contributions and continue to support the soldiers, sailors, airmen, and Marines--patriots all--that give our country the military capability it possesses. Fair and adequate compensation, housing, medical care for uniformed personnel and their dependents, tuition assistance, and even bonuses for critical specialties help fulfill our obligations to them. We will ask much of our armed forces in the months and years ahead, and they will look to us to ensure their needs and the needs of their families are attended to. We are obligated to meet those needs.

IX. SUMMARY

In summary, USCINCSPACE is assigned the mission of space control to ensure that the United States can use its military space assets to enhance our own forces and those of our Allies, while simultaneously denying hostile forces from using their space assets against us. Today, the Soviets can conduct rapidly paced, highly effective space control operations. The United States cannot. In my view, this asymmetry seriously weakens deterrence and our ability to respond appropriately to Soviet aggression should deterrence fail at any level. To quote Secretary of the Air Force Edward C. Aldridge, Jr: "In effect, we have unilaterally given the advantage to the Soviets to control space in time of conflict." The U.S. space control satellite negation program must be initiated to redress this asymmetry now. In the near term it should focus on those low-altitude Soviet satellites which most threaten U.S. and Allied terrestrial forces in crisis or in time of war. As Admiral Carlisle A. H. Trost, the Chief of Naval Operations, said: "If we are going to win at sea, we must ensure that we win in space."

In order to deter attacks against U.S. satellites, we must step up to the threat and provide for our legitimate security interests in space, just as we already do on land, at sea, and in the air. It seems oddly inconsistent to intentionally or inadvertantly create a sanctuary, especially a unilateral sanctuary, for threatening Soviet systems in space.

The current halt in Soviet "full and visible" operational testing of only one of their antisatellite systems should not be viewed as Soviet restraint or as their acceptance of the concepts advocated by the proponents of an antisatellite testing moratorium. Lack of Soviet testing is not restraint; it is more the realization that their antisatellite systems have reached the level of operational reliability that further full system testing is no longer essential.

Given our growing and already significant dependence on space systems, I am absolutely convinced we need to accelerate development of needed United States' space control capabilities.

X. CONCLUSION

Admittedly, your task is by no means an easy one. You must--as the representatives of the people of the United States--evaluate an incredibly large set of critical requirements, and--consistent with your understanding of the will of the people you represent--balance those against the realities of a finite budget. While your task is hard, mine remains impossible without a credible operational satellite negation capability.

I am the military commander uniquely charged by the President of the United States to control space in conflict. This task was assigned to me because it is essential that our nation have the credible ability to preserve our freedom of action in space if deterrence is to be maintained there. If deterrence fails, it is unlikely our national objectives can be met without the ability to operate systems in space. As the senior military commander responsible for controlling space in crisis or war, I cannot ease your burden by telling you that I assess the risks of continuing to neglect the requirement for developing a credible space control capability as small. They are not small. They are grave.

Lack of a space control capability invites deterrence to fail there, because in space we have unilaterally conceded to the Soviets a significant military advantage. If they choose to capitalize on this advantage in crisis or war, we will pay the price of our neglect in American lives. It is in contemplation of that reality that I urge you to recommend that we proceed to develop and acquire a space control negation capability at the earliest possible date.

(The following is an excerpt from the Congressional Record of March 23, 1988, Vol 134, No. 37.)

THE SOVIET SPACE STRATEGY

HON. JOEL HEFLEY
OF COLORADO
IN THE HOUSE OF REPRESENTATIVES

WEDNESDAY, MARCH 23, 1988

Mr. HEFLEY: Mr. Speaker, today marks the fifth anniversary of the Strategic Defense Initiative.

At this time, I feel it is most important to recognize the main objective and goal of SDI -- to deter and defend against Soviet strategic power and aggression. This goal is based on hard evidence that the Soviets are continually increasing and improving their military capabilities, not only in terrestrial and maritime capacity -- but also, and with even greater charge and commitment -- space.

To address this issue, I am submitting for the record an article written by General Piotrowski, "A Soviet Space Strategy".

General Piotrowski is Commander-in-Chief of the North American Aerospace Defense Command and the U.S. Space Command, both headquartered at Peterson Air Force Base in Colorado Springs. Prior to his present assignment, he was the Vice Chief of Staff of the U.S. Air Force.

Mr. Speaker, I recommend the following article to my colleagues.

Even by static indicators relating to hardware, numbers and demonstrated operational capabilities, the military space forces amassed by the Soviet Union not only are impressive, but superior in significant respects to those of the United States and its allies. Yet, a fuller appreciation of Soviet space assets can only be drawn from a projection of their dynamic role in a conflict scenario and their function in an overall, integrated plan of operations. Presented here is such a dynamic "model" featuring a plausible employment scheme for the Soviet forces. It yields the disturbing picture that even on the basis of current capabilities, the Soviets command the potential of dominating the medium of space, with all of its implications for the terrestrial and maritime dimensions of military conflict.

Western analysts and commentators most often describe the space infrastructure and space forces of the Soviet Union in terms of static comparisons with the space forces and assets of the United States and its allies. They observe that the Soviets, for example, have trained four times as many scientists and engineers, conduct five times as many launches annually, and command almost twice as many operational launch pads as the West. They boast a three-to-one (and growing) advantage over the West in manned spaceflight experience. They sustain cosmonauts on-orbit for months at a time, conduct space station resupply missions with unmanned cargo launches, and rotate crews of cosmonauts, while annually lifting to orbit ten times the weight of the materiel launched by the West. Finally, and ominously, the Soviets have one operational antisatellite system as well as three additional types that could be used during hostilities today, and are able to relaunch from the same pad in a fraction of the time it takes us in the West.

All these observations are correct. Even taken in isolation, each is impressive. Yet, generalizations drawn from an array of static indicators allow only a rough appreciation of the Soviet space program. Its true significance is that it is a military program that has resulted in a potent military space force. Of the Soviet spacecraft orbiting the earth today, over 90 per cent have military or military-related missions. Over 85 per cent are exclusively military systems.

Still, numbers alone are inadequate in assaying the capability of this force. The military utility of Soviet space forces can better be illuminated by some sort of dynamic model — a model that suggests a plausible employment scheme for the forces.

Before adducing such a model, however, several questions need to be addressed: What would a Soviet space strategy seek to accomplish? What might be the key features of a Soviet space force employment plan? Upon what would its success depend?

Basic Objectives of Soviet Space Forces

It should be recognized that any Soviet space strategy or force employment plan would be executed in support of overall geopolitical objectives and — faithful to long-standing Soviet doctrine — would be integrated with combined arms plans and operations. While the idea of a "war in space" appeals to the imagination, it is difficult to envision that any conflict involving what the Soviets would define as their vital interests would be confined to space. It is much more likely that the Soviets will always view space as an extension of the terrestrial and maritime battlefield.

For the foreseeable future, then, the focus of Soviet military space forces will probably be on their capability to support the political-military objectives of the Soviet leadership and to enhance the operations of Soviet land, naval and air forces. Operations against U.S. or allied spacecraft would, therefore, probably be undertaken with the objective of denying those terrestrial and maritime forces the essential force-enhancing services provided by spacecraft.

And, indeed, such services have become integral to contemporary force postures. Modern military operations rely on space forces for communications relay, aids to navigation, environmental data, and surveillance and warning information. Terrestrial forces denied these kinds of services are, or would be, at a considerable disadvantage — especially in the face of forces fully enhanced by them. Thus, a plausible Soviet space force employment strategy would be constructed to satisfy two tactical objectives: increase the space support provided to Soviet land, naval and air forces, while simultaneously denying space support to the forces of the United States and its allies.

Force enhancement would be accomplished by launching the appropriate kind of spacecraft at the appropriate rate and time. Denial or negation would be attained by degradation, disruption or destruction of U.S. and allied spacecraft, launch facilities and/or the many and dispersed ground-supporting systems. The latter include satellite control stations, receiving sites, data distribution and relay nodes for space-derived information and space surveillance sensor sites. Because the United States' and NATO's ground-supporting systems comprise a global network, it is likely that any conflict involving the NATO nations could also envelope some of these elements.

Coordination of Space and Terrestrial Operations

The actual Soviet employment plan would be highly dependent on a number of interrelated elements: the political objectives sought by the Soviets in general, as well as at any given point within the spectrum of conflict; their calculations of the risks and consequences of initiating a particular activity; the location and timing of their terrestrial and maritime operations; and continual assessments — within the ever-present constraints imposed by "the fog of war" — of the effectiveness of operations already prosecuted.

The last point deserves elaboration. Because the medium of space provides the vantagepoint of the ultimate "high ground," space forces have a particular potential for extending to the national leadership and combatant commanders a comprehensive understanding of the multidimensional battlefield. The degree to which this potential is realized — and once realized, exploited — largely determines the degree to which "the fog of war" is dissipated. If one side can gain a large amount of certain knowledge concerning the battlefield, and the other side is laboring under broad uncertainties, there is little doubt as to where the advantage rests. Thus, both Soviet space-support and space-denial would be truly high-leverage operations if successfully executed in anticipation of, or at the crucial moment during, terrestrial and maritime operations. This is another way of saying that the timing and tempo of Soviet space force-enhancement and force-denial activities would be determined by the timing and tempo of the terrestrial and maritime operations they support.

Still, the coordination of activities in the space dimension of the battlefield with operations in the land or sea dimensions is by no means an easy task. Land forces in contact with the enemy move at speeds measured in miles per day, naval forces at around 30 miles per hour, air forces at 500 miles per hour, while space forces travel at 17,000 miles per hour. These speed differentials spell out only part of the problem for combined arms planning and execution. Preemployment-preparation times and spacecraft dwell-times (the time when the spacecraft is in position to serve the forces it enhances) or revisit-times (how often the spacecraft returns) are especially important aspects of space force planning.

Dwell-times and revisit-times are a function of orbital mechanics, unless the spacecraft has been designed for a mission that requires maneuver. Thus, dwell-times and revisit-times are essentially fixed (within limits) in peacetime and in conflict. But preemployment-preparation times are not necessarily fixed. They comprise such time parameters as those applying to the needed manufacture of spacecraft and boosters (depending on the militarily significant inventory already available), the delivery of boosters and spacecraft to launch facilities, the integration of a particular spacecraft to a booster, the preparations for launch and the resolution of any early on-orbit anomalies and the speed with which launch pads can be refurbished for subsequent launches.

Role of Space Forces in Deterrence and Escalation

Preemployment-preparation times thus relate to the crucial factor of rapid responsiveness of space forces, including their capability to conduct "surge" operations in time of crisis. This brings us to an aspect of space forces that has failed to draw the general recognition it deserves: namely, the contributions such forces can make to deterrence — to the prevention of conflict. Thus, a launch surge during a period of tension may signal a nation's resolve and its preparedness to respond should the crisis deepen. An increase in on-orbit operational spacecraft or on-orbit spares — analogous to "forward-deployed" forces or "ready reserves" — sends a similar signal. The same is true if on-orbit spares in the "standby" mode are suddenly made operational or "mobilized."

Similarly, by launching additional spacecraft and/or maneuvering craft already in orbit to concentrate coverage over a specific terrestrial area, a nation can provide a clear indication that the area or the activities within it involve its vital interests. The advantage of all of these surge actions is that they are essentially nonthreatening and nonescalatory means of improving capability and signalling resolve, both of which can enhance deterrence. Deterrence is also bolstered by the aggressor's knowledge that an increased number of opposing surveillance and warning spacecraft can deny him the ability to achieve surprise.

Negation or denial activities can also enhance deterrence of higher-intensity forms of conflict or help provide escalation control. Yet, this option would probably entail greater risks and, therefore, would demand more careful calculations of the possible consequences.

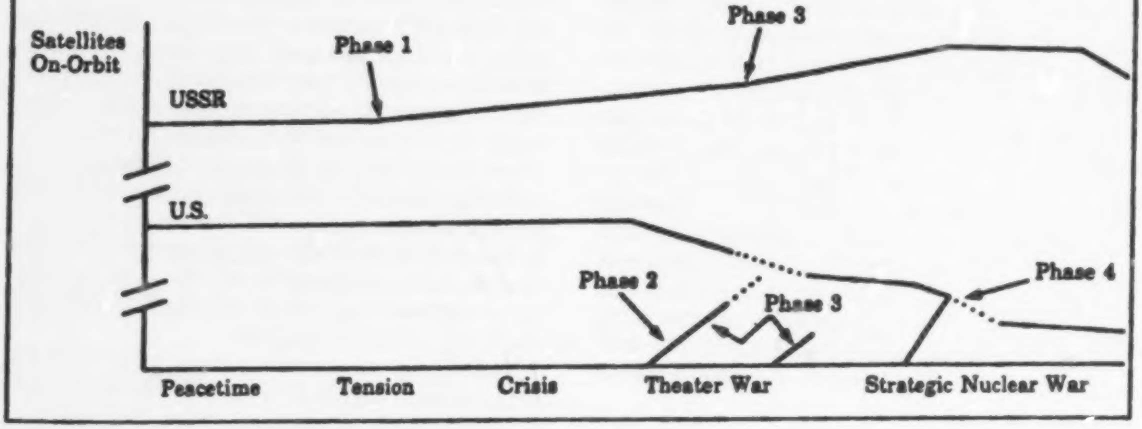
The existing Soviet Galosh antiballistic missile (ABM) system provides an example. This nuclear-armed weapon is credited with having an antisatellite (ASAT) capability. In a theater or regional conflict phase, would the Soviets use this weapon in an antisatellite role? If they do contemplate such use, they will have to calculate the consequences of crossing the nuclear threshold, the collateral effects of a nuclear detonation in low earth orbit, etc.

But the Soviets have recourse to other ASAT systems. Thus, the Soviet co-orbital satellite interceptor is armed with a conventional fragmentation warhead. Offhand, while its employment would appear to entail fewer risks, nevertheless they could be substantial. The first engagement could escalate the conflict; in fact, an antisatellite attack could very well be the commencement of hostilities. If combat had already been joined on the land, at sea or in the air, an antisatellite attack would escalate the conflict by at least extending the dimensions of the lethal battlefield.

A Soviet ASAT attack would also provide unambiguous warning to Western space forces, which could then take defensive measures against attack. Most importantly, even a conventional ASAT attack against the "sovereign possession" of a nation that had no operational

Figure 1

Model of A Plausible Soviet Space Strategy



ASAT to respond in kind (the United States is such a nation) could have unpredictable consequences for the attacker. The burden of attempting to calculate accurately an expected response falls on the shoulders of the attacking nation — much in the same way that a nation declaring "deterrence" to be its "strategy" must carefully calculate the consequences if it fails to provide the means necessary to deter.

Attributes of a Soviet Employment Plan

A Soviet space force employment plan would govern the activities of Soviet space forces across the spectrum from peace through global war by stipulating objectives for each phase. The plan would also be cast in a continuum — meaning that actions taken at the lower level of the spectrum would serve Soviet goals at that level, while also facilitating transition to the next higher level.

In the early phases, the Soviets might be careful not to take any irreversible actions — that is, they probably would concentrate on increasing the size and capability of their own on-orbit space forces without attempting to deny U.S. or allied forces "freedom of space" by engaging in denial or negation actions against them. Because Soviet space force preemployment-preparation times are so short, a surge could be undertaken with little warning. As the Soviets have demonstrated, such a surge could also be sustained for a long period.

Once the Soviets decided on conflict, they would commence denial or negation activities. These could precede terrestrial and maritime hostilities or be timed to correspond with them. One must assume, however, that a Soviet attack on U.S. or allied military spacecraft — representing, as these do, both sovereign possessions and strategic systems — would signal the Soviet intention, or at least willingness, to escalate a conflict.

It is, of course, our principal objective that deterrence not fail. Nonetheless, in adducing a plausible Soviet space force employment plan, I have generally not denied the Soviets any initiative within the range of options available to them. The model assumes that they will use their military space forces in an attempt to influence or even control the outcome of terrestrial and maritime events. The Soviet employment plan presented here is not one stolen from the inner sanctum of the Kremlin, nor is it a plan that the Soviets necessarily would have to follow. Rather, it describes a space strategy the Soviets could plausibly employ across the spectrum of conflict.

Finally, the emphasis in the model is on Soviet execution and Soviet dynamic capabilities. The range of countervailing U.S. or allied responses to the postulated Soviet space strategy — or, for that matter, any other Soviet space strategy — is not discussed. While serious asymmetries may exist today between Soviet and Western space capabilities, it is the

Table 1
A Plausible Soviet Space Strategy

Soviet Goals and Supporting Actions.	Outcome Desired by Soviets	Implications for U.S. and Allies
Phase 1 — Goal: Generation of space forces toward a warfighting posture.		
• Space launch surge begins.	• Rapid move to wartime space order of battle.	• U.S. and allies begin preparing additional spacecraft for launch
• Spacecraft launched and maneuvered to provide coverage of militarily significant activities and areas.	• Improved ability to locate, track and target forces. Enhanced global and localized capabilities: intelligence, navigation and environmental observation.	• Terrestrial and maritime forces and activities increasingly under Soviet surveillance.
• On-orbit spares in standby mode made operational.	• Improved command and control posture.	• Lacking a "surge" capability, U.S. and allied peacetime space order of battle must also be adequate for conflict
• MIR transitions to a war-supporting role. MIR crew augmented or replaced by most experienced cosmonauts..	• Improvement in real-time force direction.	
Phase 2 — Goal: Deny U.S. and allies force-enhancement provided by spacecraft.		
• Antisatellite (ASAT) operations begin: co-orbital ASAT, laser and electronic warfare attacks. Some ASAT operations continue.	• Destruction of high value U.S. and allied force-enhancing capabilities by successful ASAT engagements.	• U.S. has no operational ASAT to respond in kind. • Space forces attrited at greater rate than replenishment rate.
• Sabotage and special operations against some ground-supporting sites.		• Ability to support terrestrial and maritime forces degraded.
Phase 3 — Goal: Dominate space to control terrestrial events.		
• Launch surge sustained while ASAT operations continue.	• Negation of some critical elements of U.S. and allied space force.	• Losses of spacecraft in low-earth orbits must be compensated for.
	• Enhanced support to Soviet forces in preparation for strategic nuclear war.	
• Attacks against ground-based space support facilities.	• Degradation and disruption of U.S. and allied satellite control and data distribution capabilities.	• Soft and lightly defended sites lost. • Satellite control and data distribution shifts to mobile sites and surviving fixed sites.
	• Creation of gaps in U.S. and allied coverage and reduction in timeliness of data distribution.	• Disruptions and delays in command control and logistics communications.
Phase 4 — Goal: Soviet victory.		
• Attacks against entire U.S. and allied space infrastructure.	• Damage U.S. and allied infrastructure to degree all military utility is lost.	• Launch complexes lost, most satellite control facilities lost, on-orbit spacecraft slowly degrade.
	• Deny U.S. and allies ability to coordinate retaliatory and reconstitution activities.	• Retaliatory and reconstitution actions coordinated by other means.

role of the United States Space Command, in concert with the forces of other commanders-in-chief, to develop effective anticipatory actions and counteractions for every possible Soviet move.

Those caveats understood, I should also caution that times and numbers have purposely been omitted and that the lines and their slopes are only representative.

For simplicity's sake, I will highlight four distinct phases of Soviet space warfighting operations. These phases are identified by numbers on the model. Within each phase, I will briefly discuss plausible Soviet objectives, actions taken to support the objectives, the outcomes desired by the Soviets, and the implications for the United States and its allies. This information is summarized in Table 1.

Note that the model begins with an ordinate showing number of "Satellites On-Orbit" and an abscissa that ranges from "Peace" through "Strategic Nuclear War." The temporal and activity spectrum along the abscissa could, however, also continue into such postwar dimensions as "Reconstitution" and "Restrike." Even though those are omitted, the erroneous conclusion should not be drawn that space forces have no trans- or postwar utility. I will, by way of summary, offer the observation that the side with the longer-lived and more semi-autonomous spacecraft will have an advantage — if sufficient surviving ground segments exist to capitalize on the services that spacecraft could provide. That said, let me begin with an examination of the first phase.

A Soviet Employment Plan: Phase One

As tension mounts and the Soviets judge that the potential for armed conflict has increased, they would initiate a series of actions designed to enhance their warfighting ability. In this phase, the actions could involve their terrestrial and maritime forces. It is highly likely, however, that they would involve Soviet space forces.

Soviet space forces would begin generating toward a warfighting posture — and by that is meant a war-supporting or force-enhancing posture. The quickest way to do this would be to have sufficient on-orbit spares in the "standby" mode. These spares could be quickly and electronically "mobilized" to join already operational Soviet space forces. Another way, of course, would be to launch additional spacecraft.

A launch surge, designed to complete or reinforce Soviet force-enhancing satellite constellations, would probably also begin in this phase. We know from experience that the Soviets are capable of greatly increasing the number of space launches they normally conduct in peacetime.

A "normal" launch rate for the Soviets is approximately one space launch every four days. During the Falkland Islands conflict in 1982, however, the Soviets conducted 28 space launches in 69 days. While all these launches were not necessarily stimulated by the crisis, they do demonstrate an impressive Soviet surge capability — a capability they would undoubtedly employ in a future crisis involving Soviet interests.

Besides completing or reinforcing their on-orbit forces, the Soviets would probably also increase the number of intelligence-collecting spacecraft. This category includes Soviet radar ocean-reconnaissance satellites, electronic-intelligence ocean-reconnaissance satellites, and imagery or photo-reconnaissance satellites.

These spacecraft would be used not only to improve the Soviets' global detection and targeting capability, but would also allow them to maneuver some systems in order to provide increased localized coverage of what they judged to be militarily significant activities or areas, without simultaneously creating coverage gaps in other places. It is also likely that these unmanned capabilities will be augmented by manned spacecraft.

The Soviets profess that their cosmonauts have used visual observations, cameras, radars, spectrometers and multispectral electro-optical sensors in their "observations" from manned spacecraft. In a contingency, these capabilities — however rudimentary — could be applied to the task of locating, identifying and tracking potential targets from outer space. We also know that the MIR space station has six docking ports. These could be used to increase the military capability of the space station.

Thus, during this phase the Soviets might augment or replace the MIR crew with fresh cosmonauts — perhaps the most seasoned and experienced available — or they might launch additional modules to increase the capability of the MIR. In any case, during this phase the Soviets would generally increase the size of both their manned and unmanned space force.

The outcomes the Soviets would desire during this phase are an increased ability to keep U.S. and allied forces under surveillance; an improved ability to target those forces; improvement in real-time or near-real-time force direction and command and control capabilities; and enhanced global and localized intelligence, navigation and environmental observation capabilities.

The implications for the United States and its allies would be manifold. Terrestrial and maritime forces and activities could come increasingly under Soviet surveillance. For its part, the space surveillance network of the United States and its allies would have more objects to identify, track, monitor and catalogue. Prudence would also demand that the number of observations per object would increase in all cases, but most importantly with respect to those Soviet spacecraft with maneuver capability.

The United States and its allies might begin preparing additional spacecraft for launch in an attempt to improve capabilities commensurately. However, lacking a surge capability, the U.S. and allied peacetime space order of battle would also have to be adequate for a crisis or conflict. The small upslope in the U.S. "Satellites On-Orbit" line indicates that — depending on the length of time involved — the United States and its allies could increase their space capability by some degree.

Throughout this phase, deterrence of conflict remains the U.S. and allied goal. Space forces, along with military forces in other media, contribute to that goal. Since deterrence functions by creating a Soviet perception that the costs of their aggression will exceed the probable gains, it is vitally important that they not perceive an exploitable weakness in any area. And this leads to Phase 2.

Phase Two of the Plan

In this phase, the Soviets perceive — correctly or not — that they might achieve important advantages by denying U.S. and allied forces some of the force-enhancing capabilities provided by U.S. and allied spacecraft. They must also perceive either that they could do this without incurring grave risks or that the potential risks are worth the probable gains.

Thus, they begin antisatellite (ASAT) operations. Of the four potential ASAT technologies from which the Soviets have to choose — the Galosh, lasers, co-orbital ASATs or electronic warfare — it is likely they would choose the one adjudged to be the least observable and least escalatory. They might also decide — using similar guidelines for evaluating a hierarchy of options — to attempt to degrade U.S. and allied space capabilities by operations against the global ground-supporting network. Because elements of this infrastructure reside outside North America, the Soviets might calculate that operations against extraterritorial sites could be conducted without inviting escalation. Depending on the response, attacks against U.S. space and ground segments might increase and become increasingly overt.

If Soviet ASAT engagements were successful, U.S. and allied space forces would be attrited at a rate greater than the rate at which they could be replenished. Consequently, some U.S. and allied force-enhancing capabilities would be degraded or lost.

If the United States possessed an operational ASAT of its own, it is less likely that the Soviets would enter this phase at all. An operational U.S. ASAT not only could deter the Soviets from attacking U.S. or allied spacecraft by placing Soviet spacecraft at risk, but it could also be employed to deny the Soviets some critical force-enhancing capabilities.

Phase Three of the Plan

This phase assumes increasingly belligerent Soviet activities. Soviet ASAT attacks become more overt, as do attacks against the U.S. and allied ground-supporting space infrastructure. The Soviet goal during this phase is, quite simply, to dominate space in an attempt to increase their Soviet ability to control the outcome of terrestrial events.

The plausible outcomes desired by the Soviets would include: negation of critical force-enhancing elements of the U.S. and allied space forces; degradation and disruption of satellite control and data distribution capabilities; and creation of exploitable "gaps" in the U.S. and allied spacecraft coverage or services, including a reduction in the timeliness of data distribution.

Simultaneously, the Soviets would probably continue their launch surge to strengthen support to their forces in preparation for a potential widening or escalation of the conflict. If Soviet operations were successful, the implications for the United States and its allies would be serious. Some spacecraft, especially those in low-earth orbits, would be lost. The United States and its allies would either compensate for these losses by launching additional spacecraft, or accept the diminution in force-enhancing services. In either case, it is likely that some disruptions and delays in command control and logistics communications would occur.

Soviet attacks against ground sites would result in the loss of those that were "soft" or lightly defended. Those that had functional replacements that survived — including those with highly survivable mobile elements — would continue to operate. Still, some net loss in capability — volume, speed, access, etc. — would probably be sustained.

Having attained the level of space superiority they desired, Soviet terrestrial and maritime forces would confront U.S. and allied forces significantly disadvantaged in the force-enhancing capabilities provided by spacecraft. Assuming that the conflict were still confined to conventional operations, Western forces would be increasingly subject to "the fog of war" with its penalties of uncoordinated, ill-timed or inappropriate actions. Although conventional conflict is not necessarily a precursor to nuclear conflict, space forces would also be involved in the event of such escalation.

Phase Four of the Plan

In this phase, the entire space infrastructure comes under attack as the Soviets strive for "victory in war." Their broad aims in a global war would be to impose defeat or surrender on the United States and its allies by disrupting and destroying their military forces, to limit damage to vital Soviet political, military and economic structures, and to set the stage for domination of the postwar world.

Implications for Western Space Strategy

Some concluding observations are in order. The first is that the static indicators of Soviet military space power become truly worrisome when viewed in a dynamic context. The Soviets command a potent force, the capability to employ that force effectively in a conflict, and even today the potential capability to dominate the medium of space.

Next, it must be recognized that the plausible Soviet employment plan presented here is based only on current Soviet capabilities. The additional lift capacity of the recently tested *"Energiya"* heavy lift booster, the development of a Soviet space plane, and the launch of the Soviet space shuttle will shortly provide the Soviets with expanded military space capabilities.

Third, it appears that the advantage today in the military space forces resides with the Soviets. The momentum of the Soviet military space program, the lack of an equivalent momentum in building corresponding capabilities in the West, as well as the long lead-times required by the West to close these gaps in capabilities that have opened do not augur well for the future. The space forces of the United States and its allies do not match the Soviets in assured access to space or in militarily significant surge capability. The United States does not have today an operational antisatellite system. These deficiencies can be remedied, but only if a clear commitment is undertaken to do so.

A final observation is perhaps the most important one. The Soviet leadership may well perceive our lack of remedy to these shortcomings as a function not of programmatic errors, but of a larger failure of will. It clearly is not in our best interests for the Soviets to believe that we lack resolve. A restoration of the military space balance could contribute greatly to convincing the Soviet leadership that we have the will and the wherewithal to deter or counter effectively any military force employment plans — on land, at sea, in the air or in space — that they might contemplate. Conveying this message is the essence of deterrence. If we fail to do so, we must be conscious of the significantly heightened risks that we are thereby accepting.

Secretary of Defense Weinberger's observation demands our respectful attention: "Budget deficits and domestic program cuts can be rectified; but security shortfalls carry the risk of irreversible losses." Robust space forces can, and must, make greater contributions to our security. Superior technology and tactics may compensate for many shortcomings, but they cannot redress an inadequate force structure. That is the single most important lesson we must learn from a plausible Soviet space force employment plan.

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Statement
on
Space Control

by

General John L. Piotrowski, USAF
Commander in Chief, United States Space Command

Before the
Senate Select Committee on Intelligence
30 March 1988

STATEMENT FOR THE RECORD

SENATE SELECT COMMITTEE ON INTELLIGENCE

HEARING ON SPACE CONTROL

30 March 1988

I. INTRODUCTION AND OVERVIEW

Mr. Chairman, distinguished members of the Committee, I very much appreciate the opportunity to appear before you today in my capacity as the Commander in Chief of the joint service, unified United States Space Command (USSPACECOM), and to share with you my views on the subject of space control. My thesis is straightforward: our country needs to develop a credible operational space control capability at the earliest possible date.

In the course of these remarks, I intend to describe the space control mission and the numerous space surveillance systems and activities which contribute to it. In addition, I will describe needed improvements to these systems and underscore the urgent need for a U.S. antisatellite, or satellite negation capability. Because a Congressional Moratorium against testing an antisatellite system in space contributed to impeding development of this critical capability in the past, I will also examine the need for antisatellite testing. Throughout, I will highlight some of the more significant Soviet military space capabilities.

Although my remarks today will focus on the need for a more robust space control system, it should not be construed that this is the only military space need our nation has. While our operational military space capabilities are adequate in peacetime, they are less than equal to the demands that would be imposed by simultaneous contingencies in different parts of the world, or by a crisis which directly places the interests and military forces of the United States in opposition to those of the Soviet Union.

In these latter cases, we would currently be challenged to meet the needs of our National Command Authorities and warfighting forces for an increase in on-orbit capability--communications support, surveillance, warning, environmental sensing, and navigation support services. Added capability requires more on-orbit assets, more robust satellite constellations. There are essentially two ways of satisfying these needs: by more on-orbit capability--including operational spacecraft and on-orbit spares--routinely maintained in peacetime; or by a strategic ground reserve of replacement or substitute satellites and boosters that could be launched quickly to increase or rapidly replenish on-orbit capability during contingencies or a crisis. Our space forces also require the ability to endure.

Endurability is provided by a force structure--satellites, boosters, launch facilities, and control elements--large enough to be less sensitive to single-node or catastrophic failure, or to enemy action, and possessing sufficient survivability enhancements to ensure functional survivability. In the case of spacecraft, the nature of these enhancements is determined by the mission of the spacecraft, the particular orbit in which it operates, and its potential vulnerability to the range of threats it might face. Among these enhancements are on-board satellite attack warning systems, hardening against nuclear effects, security of uplinks and downlinks, jam-resistance, protection against directed energy attacks, manuverability, and increased satellite autonomy.

In the case of the ground-supporting satellite control and data distribution infrastructure, this means enhancements such as improved site security, mobility, proliferation, hardening, and, where appropriate, the direct downlink of data to the tactical user.

Finally, we need the ability to negate the war-supporting spacecraft of an adversary. Admittedly, that will not be an easy task. The Soviet launch infrastructure is the largest and most responsive in the world. It enables them to sustain a large on-orbit population of spacecraft and to rapidly increase or replenish their space order of battle. While more than adequate for Soviet needs in peacetime, Soviet military space capabilities are clearly designed to achieve space superiority in a crisis or conflict. Even in peacetime, their space capabilities are impressive.

The number of satellites the Soviets maintain on orbit has increased from about 120 in 1982 to about 150 in 1987, with this total as high as 160 in early 1986. The Soviets are currently placing about 40 percent of their space systems in deep space, and deep space is an area where we have a significant shortfall in our surveillance coverage.

Most Soviet space systems are on orbit to provide warfighting support to their land, sea, and air forces. Simply stated, their function is to significantly increase the risk facing U.S. and Allied soldiers, sailors, airmen, and Marines in combat. Thus, I believe--and hope to show you--that this nation and the military personnel who defend it require and deserve highly capable space control systems, including an operational antisatellite capability.

I hope to also demonstrate that a failure on our part to acquire and deploy a space control system that includes antisatellite capabilities undercuts deterrence, presently denies us the capability to respond-in-kind to Soviet antisatellite attacks, and virtually gives the Soviets a guarantee that their space systems can operate freely in space during conflict, while our own would likely be rapidly diminished as they became subjected to vigorous antisatellite attacks.

Your United States Space Command--with its Army, Naval, and Air Force component commands--was created to become the focal point for integrating those military space capabilities of our country that contribute to deterrence and to warfighting. We are also charged to be the advocates for required improvements to operational military space capabilities. With those thoughts in mind, I will proceed to describe our assigned responsibilities.

II. USCINCSPACE RESPONSIBILITIES

Our national security policy is based on the principle of deterring wars at any level rather than fighting them. For deterrence to work, it must be credible. For deterrence to be credible, an adversary must clearly recognize that he cannot achieve his objectives by resorting to armed conflict. Our national military strategy requires highly capable, forward-based land, naval, and aerospace forces. It also requires robust central reserves which are able to rapidly reinforce these forward-deployed forces. Highly capable and fully modernized nuclear forces also extend deterrence beyond the spectrum of conventional conflict.

Today, our forces are based around the globe and on the high seas far from the United States and are, therefore, heavily dependent on the communications, navigation, and surveillance and warning services provided by a comparatively small, but highly capable and absolutely vital force structure of space-based systems.

To ensure that space forces contribute to the general military capability of the United States, USCINCSPACE has been assigned the broad missions of surveillance and warning, the planning and requirements development responsibilities for ballistic missile defense, and the responsibility for space operations, which includes both space support and space control activities.

II A. SURVEILLANCE AND WARNING

The surveillance and warning mission encompasses three functions. These are: supporting NORAD with the missile warning and space surveillance information necessary to fulfill the U.S. commitment to the NORAD Agreement; providing support as necessary to commanders in chief having ballistic missile and space attack warning requirements for areas other than North America; and, should NORAD become dysfunctional for any reason, providing the U.S. National Command Authorities with integrated tactical warning and assessment of a space, missile, or air attack against the United States.

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II B. BALLISTIC MISSILE DEFENSE PLANNING

The Joint Chiefs of Staff have by means of the Unified Command Plan assigned USCINCSPACE the responsibility to plan for and to develop operational requirements for the mission of engaging attacking ballistic missiles during strategic conflict. The responsibility for planning and developing requirements should not be confused with the responsibilities of the Strategic Defense Initiative Organization (SDIO). SDIO is responsible for researching advanced defensive technologies which could be used to defend against ballistic missile attacks. USSPACECOM has no technology research responsibilities in this area.

II C. SPACE OPERATIONS

Space operations include space support activities and the space control mission. Space support activities can be best understood as "combat support," as opposed to "combat" activities. Combat support activities include supporting the launch and on-orbit requirements of other commanders in chief and operating assigned and designated force-enhancing space systems. Combat activities, specifically the space control mission, are also included in space operations.

III. FOUNDATION FOR SPACE CONTROL

III A. NATIONAL SPACE POLICY

The space control mission has its genesis in military necessity and national policy. A new National Space Policy directive was signed by President Ronald Reagan on 5 January 1988, and clearly states that one of the basic goals of the United States in space is to strengthen the national security. Our nation is committed to the use of space for peaceful purposes, including the pursuit of national security goals and the right of self-defense. This includes the conduct of national defense activities required to deter and defend against attack, and those activities required to enhance U.S. and Allied military operations if deterrence fails.

III B. DEPARTMENT OF DEFENSE SPACE POLICY

The DOD Space Policy, issued on 4 February 1987, recognizes space as a medium to conduct operations in support of our national security. It specifically describes the space control mission as consisting of the functions of satellite negation and satellite protection, including having the capability to monitor and assess all militarily significant activities in space. It states that the DOD will develop and deploy an antisatellite capability with initial operational capability at the earliest possible date.

III C. SPACE CONTROL OPERATIONS

The employment of forces in space control operations represents a combat or warfighting mission assigned to USCINCSPACE. These space control forces must have the capability, across the spectrum of conflict, to carry out the functions of detecting space objects, identifying their activities as either threatening or nonthreatening, assessing the capability and possible intent of each foreign system, and engaging or nullifying those that are the war-supporting space systems of an enemy. This latter requirement is defined in JCS Multi-Command Required Operational Capability (MROC), SM 77-88, 5 February 1988, the unclassified portions of which I will discuss later.

III D. ANALOG TO SEA CONTROL OPERATIONS

Space control, not unlike sea control for maritime operations, hinges on the ability to enforce our nation's right to safe passage. Space control operations help ensure the ability to conduct friendly operations in space, and--when necessary and directed by the National Command Authorities--to deny an adversary the use of those space systems which support hostile military forces. Negation or denial operations, however, cannot be undertaken without the support of a space surveillance system.

IV. SPACE SURVEILLANCE AND SATELLITE PROTECTION

The space control mission assigned to USCINCSPACE inherently requires the ability to maintain an accurate, timely space orbital data base. Our Space Surveillance Network is a national asset. It detects and tracks all man-made objects in space not only for DOD, but for NASA and commercial users as well. A timely and highly accurate space data base is an essential prerequisite for many of this command's activities: satellite attack warning, threat surveillance and predictions, and the compilation and maintenance of an accurate space order of battle data base. The data provided by our space surveillance sensors is also used by the U.S. intelligence community for detailed analysis of foreign space systems and capabilities.

IV A. SPACE SURVEILLANCE NETWORK

Our space surveillance sensors were not originally designed or intended to function as a network. Over time, however, operational requirements and technology were combined in such a way that an integrated network or system evolved. Today the sensors operated by USCINCSPACE's Army, Naval, and Air Force components include electro-optical telescopes, phased array and mechanical tracking radars, radio receivers, and specialized deep space radars. The command employs twenty-seven assigned sensor sites worldwide. Only ten of these sensors have space surveillance as a primary mission. The remainder have as their primary mission either missile warning, intelligence collection, or they are leased civil or commercial sensors.

The network is a predictive system and does not provide continuous monitoring of space objects. Consequently, there are exploitable gaps in our surveillance coverage both in near earth and deep space. These coverage gaps currently limit our ability to accomplish many of the time-sensitive missions dependent on rapid and accurate observations and surveillance data. Launch of a Soviet space shuttle with the ability to insert payloads into orbit will complicate the space surveillance task, if satellite insertions exploit the surveillance gaps that exist. In addition to coverage gaps, the current network does not provide adequate radar imagery of satellites or satellite signature data.

IV B. RADAR IMAGERY AND SURVEILLANCE SIGNATURES

While eighteen of our twenty-seven sensors provide satellite signature data, eleven radars provide only low quality, narrow-band time and amplitude data. In addition, six optical sensors--which are essentially limited to night time, clear weather operation--also provide optical time and amplitude data. There are only two radars capable of providing all weather, day and night, high quality wide-band radar images. As a result, high quality radar imagery of satellites often cannot be obtained as a space event occurs. Data from all the sensors is transmitted to the interactive Space Surveillance Center.

IV C. SPACE SURVEILLANCE CENTER

The USSPACECOM Space Surveillance Center is the operational command facility which manages and tasks the Space Surveillance Network, compiles and maintains the space catalog, and provides orbital support predictions to military and civilian consumers. The center computes when an object will enter a particular sensor's field of view, tasks sensors to track orbiting objects, uses sensor observations to update the space catalog and generate subsequent taskings, and continually monitors the space environment for any change resulting from launches, maneuvers, or other space events.

This process is supported by a 1970 vintage computer system which is tasked to accomplish the processing and prediction of 60,000 daily tracks on more than 7,000 orbiting objects. As the number of objects in space continues to grow, considerable stress is being placed on the capacity of our current computer system. The Space Surveillance Center also directly supports the command's Joint Space Intelligence Center and Space Defense Operations Center.

IV D. JOINT SPACE INTELLIGENCE CENTER

The Joint Space Intelligence Center was created to employ space intelligence resources and all source intelligence information to determine the status of foreign space systems. It also performs operational analysis on sensor signature and imagery data as part of the mission and payload assessment task. Mission and payload assessment allows USCINCSPACE to evaluate the potential threat posed by a foreign satellite. For example, the center enables

USCINCSPACE to identify Soviet military satellites and to warn our forces of vulnerability to their overflight. Mission and payload assessment also enables our country to monitor compliance with the United Nations treaty prohibiting weapons of mass destruction in space. Operational analysis of signature and imagery data and intelligence are also used to determine the kind or extent of any damage sustained by a satellite payload. For example, determining whether a satellite may have collided with space debris or may have been the victim of a deliberate attack. The Joint Space Intelligence Center interacts with both the Space Surveillance Center and the Space Defense Operations Center to protect friendly satellites from potentially hostile acts.

IV E. SPACE DEFENSE OPERATIONS CENTER

The Space Defense Operations Center maintains the current operational status of friendly and foreign space systems on orbit. It is essential that we maintain accurate data on all aspects of each of our space systems, including the on-orbit satellite itself, the satellites' communication links to the ground, and the status of the ground control sites that command various spacecraft. We also monitor the space systems' capability to respond to a hostile event. The current status of each of these elements is maintained on military, civil, and commercial space systems of the United States. The functions performed by these centers are so critical that alternate centers must also be maintained.

IV F. ALTERNATE SPACE CENTERS

In addition to the primary Space Surveillance and Space Defense Operations Centers located within the Cheyenne Mountain Complex at the Air Force Space Command's Cheyenne Mountain Air Force Station, we maintain an alternate location for both of these centers. The Alternate Space Surveillance and Alternate Space Defense Operations Centers are located at the Naval Space Command in Dahlgren, Virginia. While these alternate centers are austere, they provide an essential capability including vulnerability reporting which we routinely exercise to ensure the ability to perform critical functions in the event that operations in the primary centers are disrupted.

IV G. SATELLITE ATTACK ASSESSMENT

The space control resources identified above support the command's mission of providing freedom of action in space for friendly forces. Should a potentially threatening event be detected, an assessment must be quickly made in the Space Command Center--USCINCSPACE's Command Post--to determine if friendly space resources are at risk. This assessment is made by me or by a senior military officer certified by me, and requires comparative analysis with the existing space surveillance data base, analysis of all source intelligence data, and direct coordination with the owners or operators of potentially threatened space systems. This process allows USCINCSPACE to assess the likelihood that an attack is about to occur, is in progress, or has already occurred. The resultant product of the assessment process is the rapid notification to space system owners or operators, unified and specified commanders, and the National Command Authorities that an attack is imminent or has occurred. Because the accuracy and the timeliness of surveillance sensor observations determines the quality of the Space Surveillance Center's space object catalog, both the sensors and the catalog are essential prerequisites for a timely and accurate space attack assessment. The objective of all these centers and the activities which support them is ultimately the protection of friendly spacecraft.

IV H. SATELLITE PROTECTION

Few people seem to be aware that the Soviet Union has the world's only operational antisatellite (ASAT) systems. These uncontested Soviet capabilities are real, and present a threat to U.S. and Allied space systems. Today, we have very limited and only passive means of protecting our critical space systems. Once a possible threat event is detected, the operator of the potentially threatened system is notified that his satellite is vulnerable, and defensive measures such as maneuvers are recommended. However, few of our current satellites have the capability to perform defensive maneuvers. Additionally, maneuvers consume fuel and satellites are not launched with an unlimited amount of maneuvering fuel on board.

To accomplish the "protection" portion of the space control mission, we require a mix of capabilities that provide warning and detection of hostile or potentially hostile acts against U.S. satellite systems. New satellite systems are being designed and developed with improved survivability enhancements, including hardening, redundant components, proliferation, and increased maneuvering capability. It must be emphasized, however, that our current ability to detect, deter, or defend against a direct threat against our space systems is extremely limited. Whether our country decides to develop a credible, operational antisatellite system or not, future U.S. force-enhancing space systems must be designed, developed, and operated to enhance their survivability and endurability across the spectrum of conflict.

It is important to understand that our nation's military space capabilities comprise an interrelated, highly interactive **system**, although the separate elements were not originally developed as a **system**. Nonetheless, the separate elements that now comprise the system can no longer be viewed in isolation. Spacecraft maneuver capability as a defensive measure, for example, is of little utility if the network designed to identify the need for and command its maneuvers is fragile. Similarly, highly survivable satellites and highly survivable ground sites are of little use if the uplinks to the satellites are not secure, or if they are vulnerable in some other way.

The interdependence of all the elements in the system mandates that we evaluate separate elements in terms of their importance to the **overall** system. Great care is required to ensure that each link in the chain is improved and that no single link is neglected. However, there are limits to the survivability we can build into our space systems. In the final analysis, it is deterrence that provides the greatest survivability. Viewed in this light, satellite negation capabilities are an essential complement to satellite protection capabilities.

The satellite "negation" activity within the space control mission will be addressed after an examination of Soviet space control capabilities and the need to conduct extensive and realistic testing of future U.S. antisatellite or satellite negation systems. The former is critical to understanding the need for a U.S. satellite negation capability. The latter is prerequisite to development of this needed capability.

V. SOVIET CAPABILITIES

As this Committee is aware, Soviet military space doctrine holds that control of space is a prerequisite for Soviet victory on land, at sea, and in the air. To fully understand the importance of the space control negation mission, an understanding of Soviet space control and antisatellite capabilities is necessary.

Soviet space control forces include ground, sea, and space-based assets. These elements provide command and control of Soviet satellites throughout their lifetime. Ground centers include both fixed and mobile ground support facilities, and, additionally, some Soviet ships which provide instrumentation and satellite command and control.

The Soviet Union also has at its disposal multiple and diverse antisatellite systems or technologies, including co-orbital satellite interceptors, direct ascent antiballistic missiles capable of satellite interceptor operations, high energy lasers, and probably electronic warfare systems.

Directed energy weapons and electronic warfare capabilities would provide the Soviets considerable advantages, especially at the lower levels of conflict. Attacks by such weapons might be difficult to detect and harder to confirm. The outcome could be a slow degradation in capability, or the disruption of some satellite functions without the prompt physical destruction of the spacecraft. It should be no surprise that Soviet operational analysis has led them to seek development of a family of antisatellite systems that could be employed across the spectrum of conflict.

V A. CO-ORBITAL ASAT

The Soviets began testing the SL-11 launched co-orbital antisatellite system during the mid-1960s. It became and has remained operational since 1972. The antisatellite system is launched from Tyuratam, the world's largest space launch facility, into an orbit that is in the same plane as the target satellite. The target satellite is destroyed when the Soviet interceptor satellite closes on the target and explodes a conventional, multi-pellet warhead. Tyuratam has numerous launch pads and enough storage area to accommodate a substantial number of antisatellite boosters and interceptor payloads. The Soviet co-orbital antisatellite poses a considerable threat to U.S. low altitude satellites. The co-orbital antisatellite may not feature exotic techonology, but it does provide substantial space combat capability, and as I mentioned, is fully operational.

In August 1983, the Soviets declared what they called a unilateral moratorium on further antisatellite testing. Consequently, the Soviets have not conducted fully integrated testing of their entire co-orbital antisatellite system since 1982. However, the SL-11 booster which is used to launch the co-orbital antisatellite has continued to successfully launch other payloads since then. There would be nothing to preclude them from having tested other components of the system--short of impacting an object in space--separately.

V B. DIRECT ASCENT GALOSH

In addition to the co-orbital antisatellite, the Soviets have deployed a significant number of antiballistic missiles which have inherent antisatellite capabilities. The likelihood that the Soviets would employ direct ascent weapons against our satellites cannot be dismissed. The threat posed by direct ascent antisatellite weapons is at least as serious as the threat posed by the SL-11 co-orbital satellite interceptor. The Soviets, however, have not relied on kinetic kill technologies, or impact weapons alone to hold our spacecraft at risk. They also have significant potential capabilities residing in directed energy weapons.

V C. DIRECTED ENERGY

Soviet directed energy capabilities have progressed, in some cases, beyond technological research and could be developed for antisatellite use within a very short period. The Soviets have devoted considerable research to the pulsed-power techniques which are applicable not only to lasers, but also to radio frequency and particle beam weapons. At Sary Shagan alone, the Soviets are estimated to have two lasers probably capable of damaging components of satellites in orbit. The longitudinal spacing of the co-orbital satellite interceptor launch facility at Tyuratam and the laser facility at Sary Shagan ensure that critical U.S. low-altitude satellites would come within range of these threatening systems each day. We believe the Soviets could also deploy space-based lasers for antisatellite purposes in the 1990s. An airborne laser prototype system could also have an antisatellite capability in the near term.

V D. RADIO FREQUENCY

Recent Soviet developments in radio frequency (RF) energy generation have significant potential applications for a fundamentally new type of weapon that could degrade spacecraft electronics. The Soviets have generated single RF pulses in the research environment with a peak power exceeding one billion watts, and repetitive pulses of over 100 million watts. If they choose to develop a weapon system based on this technology, no significant technological obstacles stand in the way of a prototype radio frequency weapon with antisatellite applications by the 1990s.

V E. PARTICLE BEAM

Extensive research and development efforts--with military interest and support--in technologies applicable to particle beam weapons have been evident since the early 1960s. The Soviets may be able to test a prototype space-based particle beam weapon intended to disrupt the electronics of satellites during the 1990s.

V F. LAUNCH

Soviet space launch vehicles are, contrary to popular belief, extremely reliable, as evidenced by their average launch rate of nearly 100 space launches each year. The Soviets have nine operational space launch vehicles with another under development. Their newest launch vehicles are the medium-lift SL-16, and the heavy-lift SL-X-17 boosters. It should be cause for concern that estimates by the Defense Intelligence Agency indicate that during the next four years the Soviets could double their current weight-to-orbit capability. Today they have ten times as much lift capacity as we do. It is estimated that by the year 2005, the Soviets will quadruple their launch capacity, thereby exceeding their estimated requirements by nearly two million pounds annually. The U.S dollar equivalent cost to the Soviets for this excess lift capacity is staggering. The payloads to be orbited with this excess launch capacity have not yet been identified, but past Soviet practice strongly suggests they will most likely be military payloads, and that is cause for concern.

Their launch surge capability, to which I alluded earlier, is also militarily significant. They have demonstrated the ability to get a large number of spacecraft operating on orbit very quickly, and have employed this capability in their military exercises, during real-world contingencies, and to cope with unexpected failures of their own satellites. Perhaps the best example of their surge capability was provided during the Falkland Islands crisis in 1982. During a 69-day period, the Soviets conducted 28 space launches. Although not all of the launches were stimulated by the crisis, it does serve to demonstrate the reliability and responsiveness of the Soviet space launch system. It should also be noted that this surge capability has improved since 1982.

The Soviet's long term commitment to space was reaffirmed by General Secretary Gorbachev in May 1987 at the Tyuratam Space Center, prior to the first test launch of the new heavy-lift SL-X-17 space booster. He said, "We do not intend to relax our efforts and lose our vanguard position in the conquest of space." This "vanguard" position--and whatever that may mean to the Soviets--will be maintained as long as the United States lacks a robust space control capability. Achieving a credible operational space control capability is not possible without extensive and realistic testing of future types of U.S. antisatellite or satellite negation systems.

VI. THE NEED FOR ANTISATELLITE TESTING

The members of this Committee, and your colleagues in the Senate, understand the need for a U.S. satellite negation capability. In the past, many in the Senate have voted against the testing moratorium which prohibited us from testing our air-launched miniature vehicle (ALMV) anti-satellite system against objects in space. Despite your support for the development of a U.S. antisatellite system, several years of Congressional restrictions on the testing of the ALMV, compounded by inadequate funding, forced us to cancel the program.

The revised Presidential Directive on National Space Policy issued in January, 1988 directs that the Department of Defense will develop and deploy a robust and comprehensive antisatellite capability with programs as required and with initial operational capability at the earliest possible date. Therefore, the cancellation of the ALMV antisatellite is in no way indicative of a lessening need for a U.S. satellite negation capability.

It is my hope that the need for developmental testing of a U.S. antisatellite system will be seen in the light of new information on Soviet capabilities. Capabilities which--in my view--provide the compelling reasons that bolster already persuasive arguments on the need for a U.S. satellite negation capability. Toward this end it is important to understand the fallacies in arguments used by those who oppose testing.

In arguing against antisatellite testing, it has been asserted that the current situation is to the advantage of the United States, even though the Soviets already have an operational antisatellite system and we do not. This argument is based on several key assumptions, which must be examined in formalizing a coherent U.S. policy regarding development and testing of U.S. space control satellite negation systems.

Those who oppose development of a U.S. satellite negation capability have asserted that the United States is far more dependent upon its satellite systems than the Soviet Union. Therefore, in a situation where both the United States and the Soviet Union possessed effective antisatellite systems, they argue that the United States would be at a disadvantage because of its greater dependence on satellite systems.

If it is believed that it is we who are the most dependent on space-based systems, it would seem to me that our primary objective should be to do everything possible to protect those high-value assets by deterring attacks against them. We do not contribute to that goal by allowing the Soviets a unilateral antisatellite advantage.

We and the Soviets both depend heavily on space systems for such key functions as communications, missile launch detection, navigation, surveillance, and environmental monitoring. The Soviets have thoroughly integrated these vital space support functions into all aspects of their operational planning, and their peacetime as well as wartime military operations. While both our nations have capitalized on space and space-based systems to support and enhance the effectiveness of terrestrial and maritime forces, Soviet naval operations are particularly dependent on space-based capabilities.

The Soviets maintain satellites in orbit to provide timely targeting information against our forces. The Soviets have systems such as the Radar Ocean Reconnaissance Satellite (RORSAT) and the Electronic Ocean Reconnaissance Satellite (EORSAT) for which the United States has no counterpart. The mission of the RORSAT and EORSAT is to attempt to offset the advantage we have in our naval forces by detecting and locating U.S. and Allied naval forces, and then providing targeting data to Soviet combatant platforms armed with long range standoff weapons.

The Soviets also continue to improve their already impressive space-based photoreconnaissance capabilities. While the Soviets have maintained terrestrial alternatives to some space systems, they fully recognize that the speed, accuracy, and wide area surveillance capabilities of space systems are superior when it counts the most- during wartime. Having recognized their importance, the Soviets have developed and maintain a space launch infrastructure which also gives them the capability to rapidly reinforce their space order of battle, especially their highest value surveillance and targeting spacecraft.

Any U.S. antisatellite program must be directed in the near term at negating those low-altitude Soviet satellites which most threaten U.S. and Allied terrestrial and maritime forces in times of crisis or conflict. In the final analysis, we have the most to lose by conceding the use of space to the Soviets. A U.S. antisatellite system would be a valuable adjunct to other deterrent forces designed to increase the risk of Soviet adventurism in other media.

We often hear the assertion that the lack of a U.S. satellite negation capability provides or guarantees equilibrium, with neither country having an effective antisatellite system. We are told that the Soviet system is a rudimentary device, based upon 1960s technology, and does not represent a significant threat to the U.S. space systems. These assertions do not square with the facts.

From an operational military viewpoint, the lack of a U.S. antisatellite capability continues to preserve a significant advantage for the Soviets. In the Soviet view, military superiority in space is achieved by complementing the successful employment of their own satellite systems to support Soviet military operations with the use of Soviet antisatellite systems to degrade or destroy U.S. spacecraft. The Soviet Union is fully aware of the strategic importance of military satellites to the United States and the severe impact their loss would have on U.S. military capability.

Many also view the Soviet antisatellite threat as one-dimensional. It is not. The Soviets possess, as stated earlier, diverse and complementary antisatellite capabilities, including directed energy systems and direct ascent antiballistic missiles which could be employed in an antisatellite role. Further, the Soviets have the technical capability to employ electronic warfare systems and radio-electronic combat techniques against our space-based systems. These latter operations are absolutely compatible with Soviet military doctrine and have recently been discussed openly by the Soviets as having high utility against our spacecraft.

But even if the threat were one-dimensional and resided solely in the co-orbital antisatellite system, it is still not prudent to take comfort in the judgment that the system would be ineffective because the technology is simple or crude. Nor is it prudent to accept Soviet assertions that since the system has not been tested in space since 1982, it could not be employed with confidence. On the first point, we have failed to consider the possibility that "crude" or "simple" technology may be perfectly adequate, especially in wartime. We should avoid falling into the trap of judging Soviet systems by our own high technological standards. On the second point, the Soviets have used the SL-11 booster which launches the co-orbital antisatellite on numerous occasions since 1982. It has proven to be an almost perfectly reliable system. Further, we cannot be certain that the Soviets have not continued to test antisatellite systems or components separately, or in other than an operational environment. Clearly, launch crews and satellite operators can rehearse operational procedures to maintain their combat readiness without actually launching or commanding antisatellite spacecraft. In short, Soviet antisatellite systems represent real military capability, and there is no reason, no logic to even suggest the Soviets would not employ them fully in the event of conflict.

Antisatellite testing critics have also argued that continued testing of any U.S. potential antisatellite system would be destabilizing. The Soviets, they argue, would be stimulated to improve their "rudimentary" system. Eventually, an escalating antisatellite "arms race" would lead to a situation where both countries had effective systems, which proponents of this view maintain would be to the disadvantage of the United States.

From our perspective, it is the current situation which is dangerously destabilizing. Given that the Soviets and the U.S. would both be highly dependent upon their low-altitude satellites even during limited war, deterrence is not enhanced if the Soviets can depend on their own space systems and, at the same time, negate or degrade our own vital ones.

If deterrence fails for whatever reason, our lack of an antisatellite places us at a distinct disadvantage. Our military war games have repeatedly revealed what should be obvious: that--lacking a U.S. satellite negation capability--after an antisatellite attack upon our space systems, we are left with a narrow range of choices to deter further attacks upon our space assets. If we did nothing and the Soviets continued to attack our space assets, our forces would be at an extremely serious military disadvantage. If we elected an asymmetric response, under some conditions, this retaliatory response could quite possibly be misinterpreted by the Soviets and result in a further escalation of the conflict.

An operational antisatellite capability against Soviet satellites would increase deterrence, and if deterrence failed, would provide an unambiguous in-kind response which would reduce the risk of unintentional escalation.

Some have also argued that a prohibition against development of a U.S. antisatellite system--in conjunction with the Soviet's self-imposed "restraint"--constitutes a kind of arms control initiative, and prevents an extension of the "arms race" into space. I can think of little that is less binding on the Soviets than a self-imposed moratorium, although the perception that they have restrained themselves clearly has had high political utility for them.

A final assertion made by critics of developmental testing is that antisatellite testing has a dangerous collateral effect in that it creates space debris. They assert that antisatellite tests have been a major contributor to the growing hazard of collisions in space.

Space debris caused by antisatellite testing should be and is a serious concern when devising antisatellite tests. We do not want to unnecessarily endanger our own or other countries' space systems during peacetime testing. Therefore, a rigorous orbital analysis is completed prior to each test. If the analysis indicates a significant potential increase in the space debris hazard, the test is replanned.

The Air Force has developed a target--an instrumented test vehicle (ITV)--which significantly reduces space debris resulting from antisatellite testing. ITVs have less than one-tenth of the mass of the previously used target, and the fewer pieces of debris generated by an intercept fall from orbit in a matter of days. Research is continuing to devise antisatellite testing procedures that could not only minimize debris, but could also accelerate the decay process.

It is my judgment that the lack of a U.S. antisatellite system does not serve the national security. Deterrence is not enhanced by allowing the Soviet Union the world's only operational antisatellite capability. I would not suggest that we "mirror image" the Soviets by attempting to match them gun for gun or bullet for bullet. I would, however, assert that we must not concede to them a unilateral advantage in any operational medium--land, sea, air, or space. Because a prohibition against antisatellite testing has--in the past--prevented the Department of Defense from completing the normal development cycle prerequisite to declaration of operational capability, it--more than anything else--has impeded us from acquiring a validated, much-needed military capability. It would be just as inadvisable to declare a satellite negation capability operational without fully testing it, as it would be to go into series production of a tank, or a fighter, or a submarine without proper testing. While we are and must be clearly submissive to the will of the American people as it is expressed by our elected representatives, my responsibilities as a military commander require that I urge we consider the potential negative impact on our national security of failing to develop a robust, credible operational antisatellite capability.

An operational U.S. ASAT capability may well be our most urgent need. If we do not fully test and deploy a U.S. ASAT capability, we will create a Soviet sanctuary in space from which the Soviets can threaten not only vulnerable U.S. and Allied space assets, but also the ground, sea and air forces so valuable to our ability to deter both conventional and nuclear conflicts.

I solicit your support in ensuring that the U.S. is able to conduct extensive and realisitic testing of future types of antisatellite systems we determine are necessary to meet our objective of developing and deploying a robust and comprehensive satellite negation capability with an initial operational capability as soon as possible.

VII. SPACE CONTROL REQUIREMENTS

VII A. AUTHORITY

In July 1982, President Reagan announced a National Space Policy which set the direction for United States efforts in space. A key element of this policy was the direction to strengthen the security of the United States by developing "an antisatellite capability, with operational deployment as soon as possible." Again in January 1988, President Reagan signed a new National Space Policy which reaffirms that our nation is in space for peaceful purposes, that those purposes include the pursuit of national security objectives and the right of self-defense.

The two aspects of the Soviet space program which affected our security in 1982, endure today: the Soviets have the ability to destroy U.S. satellites; and, the Soviets have the ability to use satellites for surveillance and targeting of U.S. and Allied air, land, and sea forces.

VII B. SATELLITE NEGATION

The ability of the United States to deploy and employ its military forces worldwide is increasingly dependent on the freedom to operate in space. Most of our satellite systems are critical to worldwide land, sea, and air operations. Their availability is planned and expected throughout the spectrum of conflict. Yet, as I have tried to show, the United States has no capability--beyond the general military capability provided by our terrestrial and maritime deterrent forces--to protect our space systems from attack by enemy antisatellite weapons, or to deny an adversary the wartime use of space to support his terrestrial forces. Of the space-faring nations in the world today, the nation that has clearly designed its space forces to support and sustain combat operations is the Soviet Union.

U.S. space control systems, including an antisatellite capability, are required so that our country can possess the capability to disrupt, degrade, or destroy threatening space systems, or systems that support enemy operations.

In view of the importance of our space assets, and the continued need to project power to deter war and control escalation during conflict, it is essential that the United States develop and deploy an operational antisatellite system to deter the Soviets from exploiting their present antisatellite and space-based targeting capabilities.

VII C. ANTISATELLITE REQUIREMENTS

The Commander in Chief, U.S. Space Command, is assigned the mission of conducting those space control operations. Space control operations require the ability to actively and passively defend friendly space systems against a wide variety of threats. They also require the ability to disrupt, degrade, or destroy the warfighting capabilities of enemy space systems.

Forces employed in support of space control operations or performing satellite negation require the ability to carry out, across the spectrum of conflict, the functions of detecting objects and activities on the earth's surface and in the aerospace, identifying these objects or activities which are threats, assessing their capability and possible intent, and attacking or nullifying enemy warfighting or war-supporting systems that operate in space. Accomplishment of these operational functions requires a combination of highly capable surveillance and command and control systems, as well as a family of adequately tested engagement capabilities.

VII D. SPACE SURVEILLANCE IMPROVEMENTS

Given the gaps in our coverage capability and the rapidly growing number of objects in space which we must track, substantial improvements to the current space surveillance network are required. Future Space Defense Operation Center upgrades include a new, more capable computational and tracking system. A Deep Space Surveillance Radar is now essential for adequate coverage of a portion of the geosynchronous band which is populated by a growing number of Soviet military spacecraft. This surveillance radar must provide real-time deep space tracking and high quality wide-band imagery data. Negotiations with the Government of Portugal for the construction and operation in Portugal of the fifth and final Ground-Based Electro Optical Deep Space Surveillance System continue. Finally, construction has just begun on Saipan for a radar which will eliminate an important gap in our coverage over the Pacific Ocean. This radar will provide vital data on new Soviet spacecraft within hours of a launch.

In the long term, a space-based space surveillance system is required to fill remaining near earth coverage gaps and to provide time-sensitive satellite attack warning. This requirement was validated in the early 1970s and pursued by the Air Force until 1984, when responsibility for development of a space-based surveillance system was turned over to the Strategic Defense Initiative Organization. It is now referred to as the Space Surveillance and Tracking System, and must be developed to meet the needs posed by any future ballistic missile defense system along with the long-established requirement for space surveillance in support of satellite protection.

VII E. JOINT CHIEFS OF STAFF VALIDATED REQUIREMENTS

The Joint Chiefs of Staff have validated a Multi-Command Required Operational Capability (MROC, SM 77-88) for a satellite negation system. This document requires that we build a force structure that will eventually provide a satellite negation capability at all of the altitudes where hostile space systems operate.

In the near term, a capability to engage targets in low-earth orbit is vital to deter aggression and to contribute to our national security. In the mid and far terms, a mix of negation systems must provide the capability to engage enemy spacecraft at all altitudes. Such a family of systems would most likely be composed of kinetic kill vehicles, directed energy systems, and electronic warfare capabilities. This mix of systems will provide the National Command Authorities and USCINCSPACE with a range of capabilities and employment options, including the capability to degrade or disrupt the operations of enemy spacecraft, or the prompt or delayed destruction of the spacecraft themselves. The use of "soft-kill" techniques in the areas of directed energy , for example, could have extremely high utility in a low-level crisis situation, while also providing the capability to destroy enemy spacecraft at higher levels of conflict. The "hard-kill" or kinetic kill systems would most likely be utilized at higher levels of conflict to promptly and overtly negate a threatening system.

The antisatellite weapon systems comprising the satellite negation force structure should be compatible with the existing or planned USCINCSPACE command and control systems, and the existing or planned interfaces with the National Military Command System. The command control system must provide the National Command Authorities and USCINCSPACE the capability to effectively direct antisatellite operations, while at the same time providing essential information to terrestrial and maritime forces on the status of hostile space systems and activities. In view of the importance of our space assets, and the continued need to project power to deter war and control escalation during conflict, it is essential that the United States begin to develop and deploy an operational satellite negation system immediately.

VIII. PEOPLE

I would be remiss in my responsibilities if I did not also say a word about people. Secretary of Defense Carlucci rightfully made our "people" a top priority when he presented the Department of Defense's budget submission to Congress. People are our top priority.

As we enter an era of even more austere funding, I urge that we recognize their contributions and continue to support the soldiers, sailors, airmen, and Marines--patriots all--that give our country the military capability it possesses. Fair and adequate compensation, housing, medical care for uniformed personnel and their dependents, tuition assistance, and even bonuses for critical specialties help fulfill our obligations to them. As a minimum, support of a modest 4.3 percent increase in base pay is essential.

We will ask much of our armed forces in the months and years ahead, and they will look to us to ensure their needs and the needs of their families are attended to. We are obligated to meet those needs.

IX. SUMMARY

In summary, USCINCSPACE is assigned the mission of space control to ensure that the United States can use its military space assets to enhance our own forces and those of our Allies, while simultaneously denying hostile forces from using their space assets against us. Today, the Soviets can conduct rapidly paced, highly effective space control operations. The United States cannot. In my view, this asymmetry seriously weakens deterrence and our ability to respond appropriately to Soviet aggression should deterrence fail at any level. To quote Secretary of the Air Force Edward C. Aldridge, Jr: "In effect, we have unilaterally given the advantage to the Soviets to control space in time of conflict." The U.S. space control satellite negation program must be initiated to redress this asymmetry now. In the near term it should focus on those low-altitude Soviet satellites which most threaten U.S. and Allied terrestrial forces in crisis or in time of war. As Admiral Carlisle A. H. Trost, the Chief of Naval Operations, said: "If we are going to win at sea, we must ensure that we win in space."

In order to deter attacks against U.S. satellites, we must step up to the threat and provide for our legitimate security interests in space, just as we already do on land, at sea, and in the air. It seems oddly inconsistent to intentionally or inadvertantly create a sanctuary, especially a unilateral sanctuary, for threatening Soviet systems in space.

The current halt in Soviet "full and visible" operational testing of only one of their antisatellite systems should not be viewed as Soviet restraint or as their acceptance of the concepts advocated by those who oppose U.S. antisatellite development. Lack of Soviet testing is not restraint; it is more the realization that their antisatellite systems have reached the level of operational reliability that further full system testing is no longer essential.

Given our growing and already significant dependence on space systems, I am absolutely convinced we need to accelerate development of needed United States' space control capabilities.

X. CONCLUSION

Admittedly, your task is by no means an easy one. You must--as the representatives of the people of the United States--evaluate an incredibly large set of critical requirements, and--consistent with your understanding of the will of the people you represent--balance those against the realities of a finite budget. While your task is hard, mine remains impossible without a credible operational satellite negation capability.

I am the military commander uniquely charged by the President of the United States to control space in conflict. This task was assigned to me because it is essential that our nation have the **credible** ability to preserve our freedom of action in space if deterrence is to be maintained there. If deterrence fails, it is unlikely our national objectives can be met without the ability to operate systems in space. As the senior military commander responsible for controlling space in crisis or war, I cannot ease your burden by telling you that I assess the risks of continuing to neglect the requirement for developing a credible space control capability as small. They are not small. They are grave.

Lack of a space control capability invites deterrence to fail there, because in space we have unilaterally conceded to the Soviets a significant military advantage. If they choose to capitalize on this advantage in crisis or war, we will pay the price of our neglect in American lives. It is in contemplation of that reality that I urge you to recommend that we proceed to develop and acquire a space control negation capability at the earliest possible date.

PRESS CONFERENCES

SECTION III
PRESS CONFERENCES

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GENERAL JOHN L. PIOTROWSKI, USAF
PRESS CONFERENCE OPENING STATEMENT
BOISE, IDAHO
2 MAY 1988

BEFORE WE BEGIN THE QUESTION AND ANSWER PERIOD, I'D LIKE TO MAKE A FEW PRELIMINARY REMARKS. I AM PLEASED TO HAVE A CHANCE TO COME TO BOISE AND SPEAK TO YOUR COMMUNITY LEADERS AT THE LUNCHEON TODAY. A KEY PART OF MY MESSAGE TO THAT AUDIENCE IS WHY OUR COUNTRY NEEDS AN OPERATIONAL ANTISATELLITE SYSTEM.

TODAY THE LEADERSHIP OF OUR NATION IS ENGAGED IN A DEBATE OF CRITICAL IMPORTANCE. THE OUTCOME OF THIS DEBATE COULD AFFECT THE FUTURE SECURITY OF OUR NATION. THAT DEBATE IS ABOUT WHETHER OR NOT WE SHOULD CONTINUE THE MORATORIUM PLACED ON TESTING OF AN ASAT SYSTEM. RECOGNIZING THE FACT THAT WE CANNOT AFFORD TO RELINQUISH THE HIGH GROUND OF SPACE TO THE SOVIETS BY FAILING TO ACT ON THIS IMPORTANT ISSUE, PRESIDENT REAGAN WROTE, QUOTE: "THE SPACE THREAT POSED BY THE SOVIET UNION IS GROWING MORE SERIOUS AS TIME GOES ON. I CANNOT LET THIS UNILATERAL SOVIET ADVANTAGE CONTINUE UNADDRESSED. AS PRESIDENT AND COMMANDER IN CHIEF OF OUR MILITARY FORCES, I AM PERSONALLY COMMITTED TO DEVELOPING AN OPERATIONAL U.S. ASAT WHICH WILL HELP PRESERVE THE SECURITY OF THE NATION AND OUR MEN AND WOMEN IN UNIFORM." UNQUOTE.

IN MY OPINION, THE REAL QUESTIONS THE DEBATE SHOULD FOCUS ON ARE THESE: DO WE NEED TO ENSURE THE RIGHT OF SAFE PASSAGE IN SPACE FOR THE UNITED STATES AND OUR ALLIES? I WOULD ANSWER THAT WE DO. AS WITH OUR RIGHT TO FREE PASSAGE UPON THE OCEANS OF THE WORLD, WE MUST HAVE THE RIGHT, AND THE ABILITY TO ENFORCE FREE PASSAGE IN SPACE. THE NEXT QUESTION IS: DO WE NEED TO TEST OUR PROPOSED ASAT SYSTEM? AGAIN, I WOULD ANSWER THAT WE DO. WE CAN'T HAVE AN OPERATIONAL CAPABILITY UNLESS WE TEST IT.

THE FINAL QUESTION IS PROBABLY THE MOST WEIGHTY: SHOULD WE DENY OUR PRESIDENT, THE COMMANDER IN CHIEF OF OUR ARMED FORCES, THE ABILITY TO DETER SOVIET AGGRESSION AGAINST OUR SPACECRAFT----WHICH ARE SOVEREIGN POSSESSIONS----BY NOT GIVING HIM THE OPTION OF RESPONDING IN KIND TO SOVIET USE OF AN ASAT WEAPON AGAINST US? I DON'T THINK IT'S RIGHT, OR SMART, TO PUT OUR NATION IN THE POSITION WHERE OUR ONLY OPTIONS IN SUCH A CASE WOULD BE EITHER TO RETREAT FROM SPACE, OR TO ESCALATE BY RESPONDING WITH SOME ACTION ON THE LAND, IN THE AIR, OR AT SEA.

THE SOVIETS HAVE HAD AN OPERATIONAL ANTISATELLITE SYSTEM SINCE 1971. THEY DON'T NEED FURTHER TESTING FOR THIS SYSTEM BECAUSE IT HAS BEEN, AND REMAINS, OPERATIONAL. I SHOULD ALSO POINT OUT THAT THE SOVIETS HAVE NOT LIMITED THEMSELVES TO SIMPLY ONE ASAT

SYSTEM. THEIR GALOSH ANTIBALLISTIC MISSILE INTERCEPTORS ARE BELIEVED TO BE CAPABLE OF ASAT OPERATIONS. THEY ALSO HAVE POWERFUL GROUND-BASED LASER SYSTEMS WHICH MAY HAVE THE CAPABILITY TO DAMAGE SATELLITES IN LOW-EARTH ORBIT OR TO INTERFERE WITH THEM ALL THE WAY OUT TO GEOSYNCHRONOUS ALTITUDES. FINALLY, THEY ALSO POSSESS GROUND-BASED SYSTEMS CAPABLE OF RADIO-ELECTRONIC COMBAT OR ELECTRONIC WARFARE AGAINST OUR SATELLITES.

WE SHOULD REMEMBER THAT THE U.S. HAS NO CAPABILITY TO RESPOND IN A PROPORTIONAL MANNER TO SOVIET USE OF ANY OF THEIR ASAT SYSTEMS. OUR UNILATERAL CONCESSION IN THIS AREA IS AS TROUBLESOME AS IT IS OBVIOUS. WHILE WE HAVE DEBATED AND AGONIZED OVER HOW TO PROCEED WITH OUR ASAT PROGRAM, THE SOVIETS HAVE PRESSED RAPIDLY AHEAD BY DEPLOYING THEIR OWN OPERATIONAL SYSTEM. THEY ARE NOW ORCHESTRATING AN AGGRESSIVE CAMPAIGN TO PREVENT PROGRESS ON OUR ASAT BY WHAT THEY CALL "A SELF-IMPOSED MORATORIUM" ON FURTHER ASAT TESTING. TO BE MISLED BY THIS THINLY VEILED PROPAGANDA IS NAIVE, TO NOT RESPOND DIRECTLY IS SHORTSIGHTED.

IF WE CONTINUE TO ALLOW THE SOVIETS TO ENJOY THIS UNILATERAL ADVANTAGE IN SPACE, WE VIRTUALLY CONCEDE THE FACT THAT SHOULD HOSTILITIES EVER BREAK OUT THEY COULD MAKE A DETERMINED EFFORT TO DOMINATE SPACE. BY

NOT FULLY TESTING AND DEPLOYING OUR OWN ASAT, WE ARE CREATING A SANCTUARY IN SPACE FOR SOVIET SATELLITES WHICH ARE USED TO LOCATE AND TARGET OUR FORCES, WHILE U.S. AND ALLIED SPACECRAFT REMAIN VULNERABLE TO SOVIET ASAT ATTACKS. THIS CONCESSION TO THE SOVIETS WEAKENS OUR NATIONAL SECURITY AND, IN MY VIEW, IS NOT WHOLLY RESPONSIBLE.

OUR NATION NEEDS TO ACQUIRE AN OPERATIONAL ANTISATELLITE SYSTEM. I HOPE THE FACTS I HAVE PRESENTED TODAY GIVE YOU A CLEARER PICTURE OF SOME OF OUR NEEDS IN SPACE AND WHAT I NEED AS AN OPERATIONAL COMMANDER. YOU MAY HAVE SOME QUESTIONS ABOUT THESE, OR OTHER ISSUES, AND I WOULD BE PLEASED TO TRY TO ANSWER THEM.

PUBLISHED ARTICLES

SECTION IV
PUBLISHED ARTICLES AND SELECTED CONTRIBUTIONS AND REPRINTS

Article	Date	Page
"Space Strategy" AIR CLUES, The Royal Air Force Magazine	March 1988	407
CINC's Corner SPACE OBSERVER	28 April 1988	415
"Space Leadership: Vision or Vanity?" SIGNAL	May 1988	417
"Antisatellite System: A Hard Choice" DEFENSE NEWS	22 August 1988	423
Anniversary Message SPACE TRACE	26 August 1988	425
CINC Page, "Space Evolution" SIGNAL	September 1988	427
"Pioneering the Last Frontier" SPACE	September/October 1988	429
POW/MIA Message SPACE OBSERVER	15 September 1988	435
"The Military in Space" Armed Forces Information Service	17 October 1988	437
"Slaying the Archer" AIRFORCE, Royal Canadian Air Force Magazine	October/November/ December 1988	439

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"Space Commander Aims at Sky vs Space Barrier" AIR FORCE TIMES	14 November 1988	443
"Space Operations Tomorrow: Emphasizing the Tactical" DEFENSE 88	November/December 1988	445
"Soviet Space Doctrine for Warfighting" SIGNAL	December 1988	453
"Space Strategy" SPACE OBSERVER	19 January 1989	459
Letter to the Editor St Louis POST-DISPATCH Newspaper	25 January 1989 (appeared in newspaper)	461
Letter to the Editor Los Angeles TIMES Newspaper	30 January 1989 (appeared in newspaper)	463
"Military Developments in Space" ROYAL UNITED SERVICES INSTITUTE DEFENCE YEARBOOK	1989	465

AIR CLUES

THE ROYAL AIR FORCE MAGAZINE

VOLUME 42
NUMBER 3

MARCH 1988

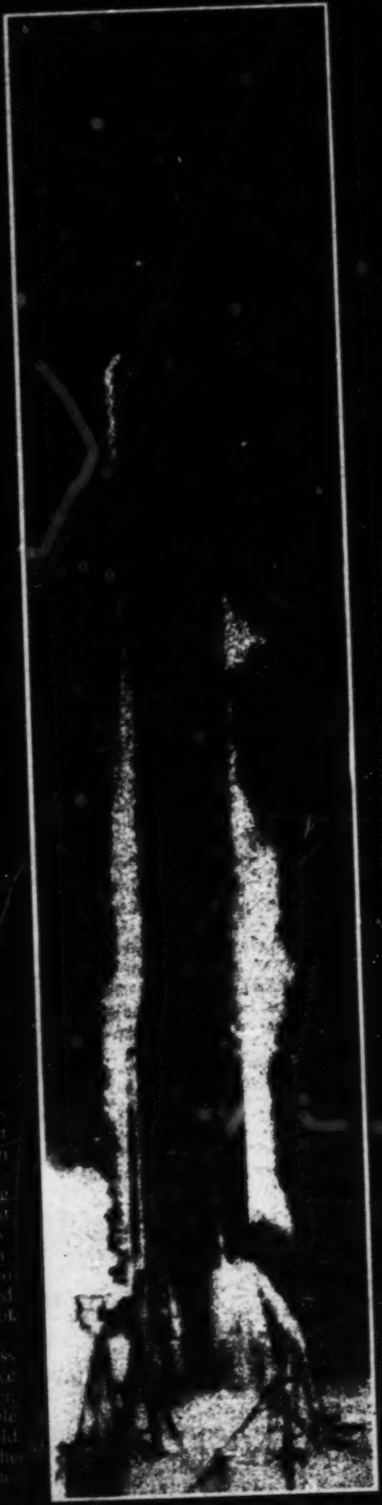
SPACE STRATEGY

407

Space Strategy

by

Commander in Chief,
North American Aerospace Defense Command
and
U.S. Space Command

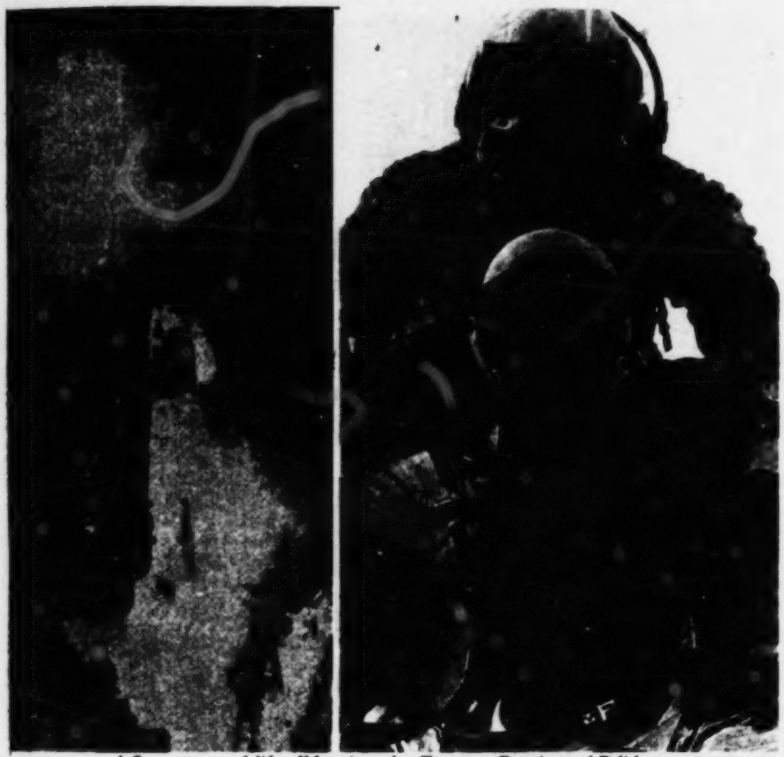


It is no longer deemed especially insightful to assert that the introduction of the aircraft revolutionized warfare. Nor is it profound to assert that a nation can no longer be viewed as an authentic military power unless it possesses a fleet of military aircraft dedicated to missions ranging from close air support to long-range bombardment, and encompassing every mission in between: airlift, aerial resupply, in-flight refuelling, aeromedical evacuation, air superiority, tactical reconnaissance, maritime patrol, and on and on. Even ground forces and naval forces have their own indigenous air elements. We know from experience, sometimes bitter, that control of the air is a prerequisite to victory on the land and at sea.

The revolution that began with the introduction of the aircraft continues, and air has become aerospace. This article discusses the implications that operations in space have for strategy in the future.

Although there are many space-faring nations today, there are only two that can be characterized as space powers: the United States and the Soviet Union. The space capabilities of these two nations are different and are structured and operated to serve separate visions of national security.

It would not be appropriate to discuss the responses of the West to Soviet space force employment. It would, however, be informative to describe a plausible space strategy that the Soviets could employ as a means of illustrating the impact that space will have on the strategy and tactics of the future.



A Soyuz spacecraft lifts off from its pad at Tyuratam. Russsian and Polish cosmonauts at pre-flight training. The USSR conducts five times as many launches annually as the USA, whilst sustaining crews of cosmonauts in space for many months at a time.

Static Comparisons

Western commentators and analysts most often describe the Soviet space infrastructure and Soviet space forces in terms of static comparisons with United States and Alliance space forces. They observe that the Soviets, for example:

- have four times as many scientists and engineers
- conduct five times as many launches annually
- have almost twice as many operational launch pads
- have a three-to-one (and growing) advantage in manned spaceflight experience
- sustain cosmonauts on-orbit for months at a time, conduct space station resupply missions with unmanned cargo launches
- rotate crews of cosmonauts
- annually lift ten times the weight to orbit
- have one operational and three additional types of antisatellite systems which could be used during hostilities today'
- and are able to relaunch from the same pad in a fraction of the time it takes us in the West.

All of these observations are correct and each, even taken in isolation, is impressive.

However, generalizations drawn from an array of static indicators only allow a rough appreciation of the significance of the Soviet space programme. Its real significance is that it is a military programme that has resulted in a potent military space force. Of the Soviet spacecraft orbiting the earth today, over 90% have military or military-related missions. Over 85% are exclusively military systems.

Dynamic Comparisons

Yet numbers alone are inadequate to describe the capability of this force. The military utility of Soviet space forces can be better illustrated by some sort of dynamic model — a model that suggests a plausible employment scheme for these forces. Later in this article I will present such a scheme, but before I do that I need to answer a few questions. What would a Soviet space strategy seek to accomplish? What might be the key features of a Soviet space force employment plan? Upon what would its success depend?

Objectives

It should be recognized that any Soviet space strategy would be executed in support of overall geopolitical objectives and — faithful to long-standing Soviet doctrine — would be integrated with combined arms plans and operations. While the idea of a war in space is certainly interesting to contemplate, it is difficult to envisage that any conflict involving what the Soviets would define as their vital interests would be confined to space. It is much more likely that they would always view space as an extension of the terrestrial and maritime battlefields. For the foreseeable future then, the focus of Soviet military space forces will probably be on their capability to enhance the operations of their land, naval, and air forces. Operations against United States or Allied spacecraft would, therefore, probably be undertaken with the objective of denying those terrestrial and maritime forces the essential force-enhancing services that spacecraft provide.

And as modern military operations rely enormously on space forces for communications relay, aids to navigation, environmental data, and surveillance and warning information, military units denied these kinds of services would be at a considerable disadvantage — especially if facing forces fully enhanced by them.

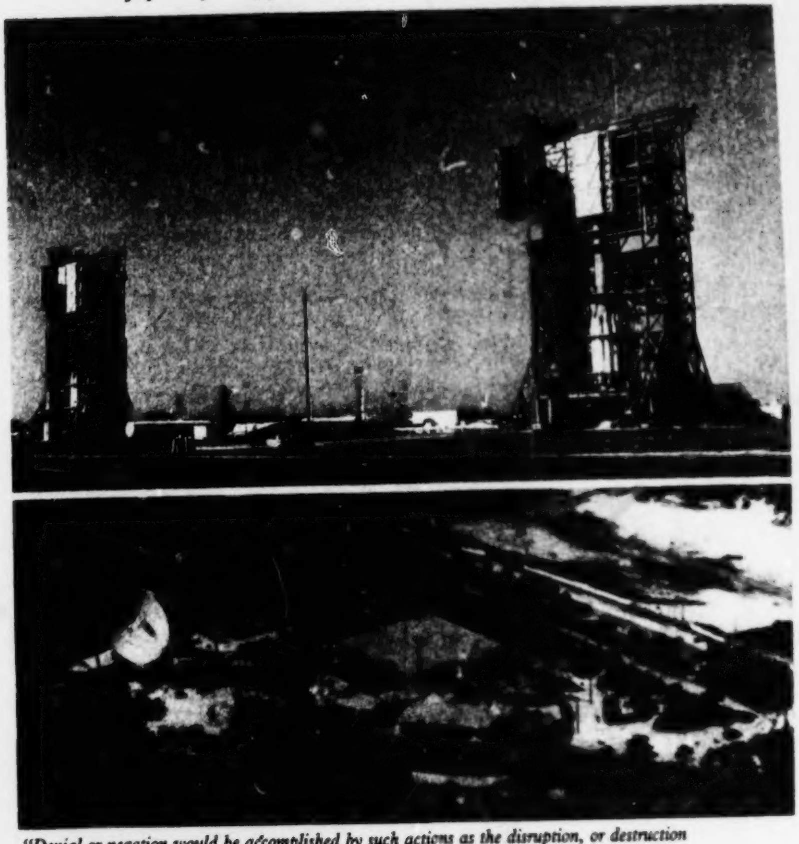
"For the forseeable future the focus of Soviet military space efforts will probably be to enhance the operations of their land, naval and air forces."

Building a Strategy

Thus, a plausible Soviet space force employment strategy would probably be built to satisfy two tactical objectives: namely to increase the space support provided to Soviet land, naval, and air forces, while simultaneously denying space support to United States and Allied forces.

Force enhancement would be accomplished by launching the right kind of spacecraft, at the right rate and at the appropriate time. Denial or negation would be accomplished by the degradation, disruption, or destruction of United States and Alliance spacecraft, launch facilities, or the many and dispersed ground-supporting systems. Amongst the latter are included satellite control stations, receiving sites, data distribution and relay nodes for space-derived information, and space surveillance sensor sites. Because the United States and Allied ground-supporting systems comprise a global network, it is likely that any conflict involving the NATO nations would also envelop some of these elements.

Because the medium of space provides the vantage point of the ultimate 'high-ground', space forces have great potential for national leadership and combatant commanders with a comprehensive understanding of the multi-dimensional battlefield. The degree to which this potential is actualized, and once actualized employed, largely determines the degree to which the fog of war is dissipated. If one side has a large amount of certain knowledge whereas the other side is labouring under large uncertainties, there is little doubt who has the advantage.



"Denial or negation would be accomplished by such actions as the disruption, or destruction of United States launch facilities and a variety of ground support and space surveillance sensor sites."

Thus, both Soviet space support and space denial operations could be truly high leverage operations. Indeed, the timing and tempo of Soviet space force enhancement and force-denial activities would be determined by the timing and tempo of the terrestrial and maritime operations they support — although the coordination required would not be an easy task.

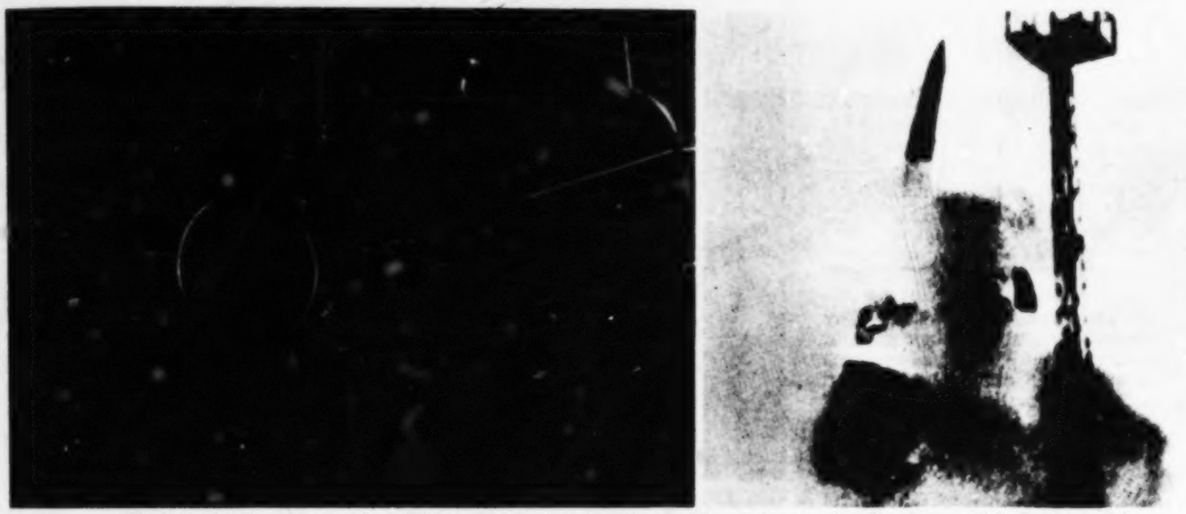
Combined Arms Planning

Land forces in contact with the enemy move at speeds measured in kilometers per day, naval forces move at around 45 kilometers per hour, air forces at 800, and space forces at 27,000 kilometers per hour. These speed differentials are only part of the combined arms planning and execution problem. Pre-employment preparation times and spacecraft dwell-times (the time when the spacecraft is in position to serve the forces it enhances) or revisit times (how often the spacecraft returns) are especially important space force planning considerations.

Dwell-times and revisit times are a function of orbital mechanics, unless the spacecraft has been designed for a mission that requires manoeuvre. Thus, dwell-times and revisit times are essentially fixed (within limits) in peacetime and in conflict. But pre-employment preparation times are not fixed — that is the time it takes to manufacture spacecraft and boosters, to deliver boosters and spacecraft to launch facilities, to integrate a particular spacecraft to a booster, to erect, fuel, and checkout a system during the pre-launch phase, to resolve launch anomalies before the spacecraft begins functioning, and to refurbish launch pads for subsequent launches. Obviously, in a crisis, surge operations would be desirable and would be undertaken.

Deterrence

Just as the ability to surge is a tremendous operational advantage, so too is the converse a tremendous disadvantage. Besides the burden of tactical



"The Soviet Galosh nuclear-armed anti-ballistic missile has an antisatellite capability. In the regional conflict phase would the Soviets use such a weapon? Perhaps, but not without assessing the consequences of crossing the nuclear threshold."

inflexibility in a conflict, other pre-conflict capabilities of military space forces are lost when rapid responsiveness is lost. Let me elaborate.

The services provided by space forces are absolutely essential during a conflict. But many people fail fully to appreciate the contributions space forces can make to deterrence — that is to prevent conflict. For example, a launch surge during a period of tension may signal a nation's resolve and its preparedness to respond, should a crisis deepen. The increase in on-orbit operational spacecraft or on-orbit spares, analogous to forward deployed forces or ready reserves, sends the same signal. The same is true if on-orbit spares in the standby mode are suddenly made operational, or are mobilized. Similarly, by launching additional spacecraft or by manoeuvring spacecraft to concentrate coverage (more spacecraft, reduced revisit intervals, and so on) over a specific area, a nation can provide a clear indication that the area or the activities in the area involve its vital interests. The advantage of all of these surge actions is that they are essentially a non-threatening and a non-escalatory means of improving capability and signalling resolve — both of which can enhance deterrence. Deterrence is also enhanced by the aggressor's knowledge that an increased number of friendly surveillance and warning spacecraft can deny him the ability to achieve surprise.

Warfighting

Negation or denial activities can also enhance deterrence of higher intensity forms of conflict or help provide escalation control, but they would probably entail greater risks and, therefore, would demand more careful calculations of the possible consequences.

The Soviet Galosh antiballistic missile (ABM) provides an example. This nuclear-armed weapon is assessed as having an antisatellite (ASAT) capability. In the theatre or regional conflict phase, would the Soviets use this weapon in an antisatellite role? Perhaps, but they would have had first to calculate the consequences of crossing the nuclear threshold, the collateral effects of a nuclear detonation in low earth orbit, and so on.

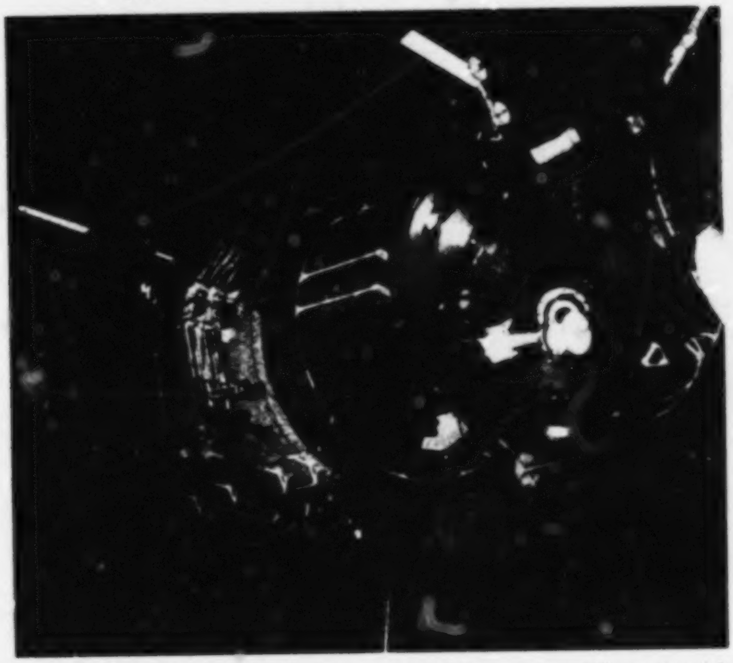
The use of other antisatellite systems, however, may be rather different. The Soviet co-orbital satellite interceptor is armed with a conventional fragmentation warhead. Its employment might appear to entail fewer risks. Yet the risks could be greater and more grave. The first engagement could escalate the conflict. In fact, an antisatellite attack could very well be the commencement of hostilities. If combat had already been joined on the land, at sea, or in the air, an antisatellite attack would escalate the conflict by at least extending the dimensions of the lethal battlefield. A Soviet ASAT attack would also provide unambiguous warning to friendly space forces, which could then take defensive measures in an attempt to reduce the likelihood that subsequent engagements would be successful. Most importantly, even a conventional ASAT attack against the sovereign possession of a nation that had no operational ASAT to respond in kind (the United States is such a nation) could have unpredictable consequences for the attacker. These consequences might be very grave indeed. The burden of attempting to calculate an expected response accurately falls on the shoulders of the attacking nation.

A Plausible Model

A Soviet space force employment plan would govern the activities of Soviet space forces across the spectrum from peace through global war, by stipulating objectives for each phase.

In the early phases, the Soviets might be careful not to take any irreversible actions. They would probably concentrate on increasing the size and capability of their own on-orbit space forces without attempting to deny United States or Allied forces freedom of space by engaging in denial or negation actions against them. Because pre-employment preparation times for Soviet space forces are so short, a surge could be undertaken with little warning. As the Soviets have demonstrated, it could also be sustained for a long period.

When the Soviets decided that peace was no longer in their best interests and that deterrence had failed, they would commence denial or negation activities. These might precede terrestrial and maritime hostilities or might be timed to correspond with them. One must assume, however, that a Soviet attack on a United States or Allied military spacecraft, representing, as these do, both sovereign possessions and strategic systems, would signal the Soviet inten-



"We know the Mir Spacecraft has six docking ports and these could effectively be used to increase the military capability of the space station."

tion (or at least willingness) to escalate a conflict — in other words, that deterrence had failed.

It is, of course, our principal objective that deterrence should not fail. Nonetheless, in building a plausible Soviet space force employment plan, I have generally not denied the Soviets any initiative they might take. We should assume they would use their military space forces in an attempt to influence or control the outcome of terrestrial and maritime events. For simplicity's sake, I will highlight four distinct phases of Soviet space warfighting operations.

Phase 1

As tension mounted and the Soviets judged that the potential for armed conflict had increased, Soviet space forces would begin generating towards a warfighting posture — and by that I mean a war-supporting, or force-enhancing posture. The quickest way to do this would be to have sufficient on-orbit spares in the standby mode. These spares could be quickly and electronically "mobilized" to join already operational Soviet space forces. Another way, of course, would be to launch spacecraft.

A launch surge, designed to complete or strengthen Soviet force-enhancing satellite constellations, would probably also begin in this phase. We know from experience that the Soviets are capable of greatly increasing the number of space launches they normally conduct in peacetime.

A normal launch rate for the Soviets is approximately one space launch every four days. During the Falkland Islands conflict in 1982, however, the Soviets conducted 28 space launches in 69 days. While all these launches were not necessarily stimulated by the crisis, they do demonstrate an impressive Soviet surge capability — a capability they would undoubtedly employ in a future crisis involving Soviet interests.

Besides completing or enhancing their on-orbit forces, they would probably also increase the number of intelligence-collecting spacecraft. In this category I include Soviet radar ocean reconnaissance satellites, electronic-intelligence ocean reconnaissance satellites, and imagery or photo-reconnaissance satellites.

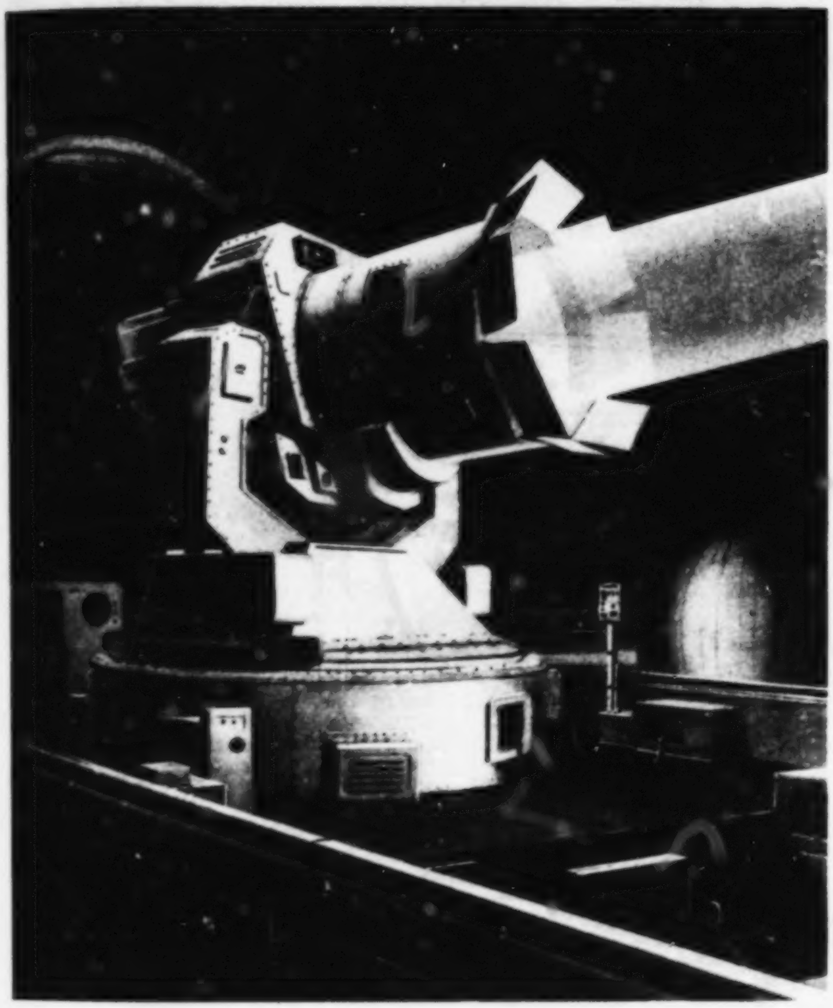
These spacecraft would be used not only to improve their global detection and targeting capability, they would also allow the Soviets to manoeuvre some systems to provide increased localized coverage of what they judged to be militarily significant activities or areas, without simultaneously creating coverage gaps in other places. It is also likely these unmanned capabilities would be augmented by manned spacecraft.

The Soviets profess that their cosmonauts have used visual observations, cameras, radars, spectrometers, and multi-spectral electro-optical sensors in their observations from manned spacecraft. In a contingency, these capabilities — however rudimentary — could be applied to the task of locating, identifying, and tracking potential targets from outer space. We also know that the MIR space station has six docking ports. These too could be used to increase the military capability of the space station.

Thus, during this phase the Soviets might augment or replace the MIR crew with fresh cosmonauts — perhaps the most seasoned and experienced available — or they might launch additional modules to increase the capability of the MIR. In any case, it is unlikely that during this phase the Soviets would neglect to increase the size of both their manned and unmanned space force.

The outcomes the Soviets would desire during this phase are an increased ability to keep US and Allied forces under surveillance, an improved ability to target those forces, an improvement in real-time or near real-time force direction and command and control capabilities, and enhanced global and localized intelligence, navigation, and environmental observation capabilities.

The implications for the US and our Allies would be many. Terrestrial and maritime forces and activities could come increasingly under Soviet surveillance. The friendly space surveillance network would have more objects to identify, track, monitor, and catalogue. Prudence would also demand that the number of observations per object would increase in all cases, in particular for those Soviet spacecraft with a manoeuvre capability.



Of the four potential antisatellite (ASAT) technologies from which the Soviets have to choose — the Galosh, lasers (above), co-orbital ASATs, or electronic warfare, — it is likely they would choose the one they judged as the most clandestine and least escalatory.

The US and its Allies might begin to prepare additional spacecraft for launch in an attempt to improve their own capabilities. However, lacking a surge capability, the US and Allied peacetime space order of battle would also have to be adequate for a crisis or conflict.

Throughout this phase, deterrence of conflict would remain the US and Allied goal. Space forces, along with military forces in other media, contribute to that goal. Since deterrence works by creating a Soviet perception that the costs of their aggression would exceed the probable gains, it is vitally important that an adversary should not perceive an exploitable weakness in any area. And that leads to Phase 2.

Phase 2

In this phase, the Soviets would perceive that they might achieve important advantages by denying US and Allied forces some of the force-enhancing capabilities provided by US and Allied spacecraft. They must also either perceive that they could do this without incurring grave risks, or that the potential risks were worth the probable gains.

Thus, they would begin ASAT operations. Of the four potential ASAT technologies from which the Soviets have to choose (the GALOSH, lasers, co-orbital ASATS, or electronic warfare) it is likely they would choose the one they judged as the most clandestine and least escalatory. They might also decide, using similar guidelines for evaluating a hierarchy of options, to attempt to degrade US and Allied space operations, by acting against the global ground-supporting network. Because some elements of this infrastructure are outside North America, the Soviets might perceive that operations against extra-territorial sites could be conducted without inviting escalation. Depending on the response, attacks against space and ground segments might increase and become increasingly overt.

If Soviet ASAT engagements were successful, US and Allied space forces would be incapacitated at a rate greater than the rate at which they could be replenished. Consequently, some US and Allied force-enhancing capabilities would be degraded or lost.

If the US possessed an operational ASAT of its own, it is less likely that the Soviets would enter this phase at all. An operational US ASAT could not only deter the Soviets from attacking US or Allied spacecraft by placing Soviet spacecraft at risk, but it could also be employed to deny the Soviets some critical force-enhancing capabilities if deterrence failed.

Phase 3

This phase assumes increasingly belligerent Soviet behaviour. Soviet ASAT attacks would become more overt, as would attacks against the friendly ground-supporting space infrastructure. The Soviet goal during this phase would be quite simply to dominate space in an attempt to increase the Soviet ability to control the outcome of terrestrial events. Simultaneously, the Soviets would probably continue their launch surge to enhance support to their forces in preparation for a potential widening or escalation of the conflict.

If Soviet operations were successful, the implications for the US and our Allies would be serious. Some friendly spacecraft, especially those in low-earth orbits, would be lost. The US and its Allies would either compensate for these losses by launching additional spacecraft, or accept the diminution in force-enhancing services. In either case, it is likely that some disruptions and delays in command, control and logistics communications would occur.

Attacks against ground sites would result in the loss of those that were soft or lightly defended. Those that had functional replacements that survived, including those with highly survivable

Col. Yuri Romanenko, Soyuz TM-2 mission commander. "Some 34 living cosmonauts currently hold officer rank in the Soviet Air Force. . . . There is no lack of military space operations experience in the Soviet armed forces."

mobile elements, would continue to operate; however, some net loss in capability, volume, speed, access, and so forth, would probably result.

Having attained the level of space superiority they desired, Soviet terrestrial and maritime forces could have advantages that US and Allied forces, denied some force-enhancing capabilities provided by spacecraft, did not have.

Assuming that the conflict was still confined to conventional operations, Soviet space superiority could result in friendly forces being increasingly enshrouded by the fog of war — with the increased likelihood of uncoordinated, ill-timed, or inappropriate actions. Soviet forces, on the other hand, might not have those burdens to bear.

Although conventional conflict, no matter how intense or widespread, would not necessarily be a precursor to nuclear conflict, space forces would also be involved if the conflict escalated to that level.

Phase 4

In this phase, the entire space infrastructure would come under attack as the Soviets strove for victory in war. Soviet doctrine anticipates that combat at all levels could continue for a protracted period even following nuclear exchanges. Since it is extremely unlikely that the Soviets would be able to defend their launch complexes in a nuclear exchange, their on-orbit space forces would be the only ones available to support protracted war or Soviet postwar aims. However, even the best of Soviet spacecraft suffer from being short-lived. Thus, in the end, *our* surviving space forces would be larger and more capable than those of the Soviets. I hasten to add, however, that does not constitute what one would thoughtfully call a victory, because victory after all, is achieved by using space forces to deter war in the first place.

* * *

A few concluding observations need to be made. First, strategic planning, and even tactics, must begin to consider the impact space operations can have on terrestrial, maritime, and atmospheric military operations. It will become increasingly dangerous to ignore this newest dimension of the battlefield. That leads to a second observation. The generals, admirals, and air marshals of the future are among us today. As we attend to their professional military education, we must ensure that their awareness embraces a vision of the battlefield of tomorrow, a battlefield that will most assuredly encompass space.

This is a point not lost on the Soviets. Some 34 living cosmonauts hold officer rank in the Soviet Air Force. Of the 34, there are 15 who have completed a three-year course of instruction on military affairs and the operational art at the Gagarin Military Air Academy. Thirteen others have completed a five-year program at the Zhukovsky Military Air Engineering Academy. There is no lack of military space operations expertise in the Soviet armed forces.

Clearly we need to accelerate our efforts to introduce and expand awareness of military space operations into professional military school curricula, war-gaming, and exercises. Our national security responsibilities demand that we should never be guilty of the allegation that we spend our time fighting the last war.

We would also do well to increase the cross-feeding of talent, information, and people among the Alliance space-faring nations. A vigorous officer and noncommissioned officer exchange program, if judged advantageous, ought to be a high priority.

Finally, our capability to defend Allied space systems, including the ground-based infrastructure, must grow at least at the same rate as our dependence on those systems. Like forces in any other medium, space systems are only as strong as their weakest link.

Our space systems came to maturity in an era when the only threats posed to them were posed by the characteristics of space itself. Those happy days are gone forever. As we face the future, we must build our space systems with a realization that we must defend them. We are doing that.

The goal remains to deter aggression, not only on land, at sea, and in the air, but also in space or from space. Aware of the challenge, I am confident we will step up to it together.

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THURSDAY April 28, 1988

CINC's Corner

People still top priority in DOD

When Secretary of Defense Frank Carlucci presented his annual report to Congress, he stated that the Department of Defense's budget priorities were people, readiness and sustainability. There should be no doubt that **people** are, and must remain, our top priority. Why?

Primarily because we cannot have an armed force without people. It is people who make the computers hum, the aircraft fly and the ships steam. It is people who have taken a solemn oath to defend this country and her friends and allies.

Each of our weapons systems has a person in the loop — a human being responsible and accountable for its proper and effective functioning.

Our men and women, therefore, are both the foundation and pinnacle of our defense establishments. They deserve the best support and leadership we can provide.

Pay, dependent medical care, education assistance and adequate housing are not "benefits," they are the hard-earned and well-deserved entitlements of military service.

Leaders of every service and every military grade understand that people must be our foremost concern and that everything that affects their health, welfare and morale is important.

Each commander and supervisor needs to rededicate themselves to our people. In my job that means confronting Congress — as I have already done this year — with the absolute need for adequate compensation and a 4.3 percent pay raise in 1989.

At your level, it may be a thoughtful word of sincere thanks for a job well-done, or a re-appraisal of your level of sensitivity to the issues that involve your people.

All of us can and must put people first. It's a false dilemma to continue a choice between "people" and "mission." The real priority is to take care of the **people** who take care of the mission!

SIGNAL

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Space Leadership: Vision or Vanity?

By Gen. John L. Piotrowski, USAF

Figure 1. U.S. space shuttle.

To explore space is a noble goal, but to preserve the national security, to protect U.S. space assets, to ensure the right of free passage and to safeguard future explorers is a solemn obligation. It is an unavoidable prerequisite to pursuing more exciting goals.

The subject of space leadership has been at the center of debate since the shuttle *Challenger* was lost in January 1986. To look toward the future of space leadership, it is necessary to first look at the past to determine whether the quest for leadership is illusory and vain or whether it is attainable and visionary.

In the 25 years prior to the *Challenger* tragedy, the United States as a nation had become used to being the world's leader in space. U.S. accomplishments had been nothing short of spectacular, and whatever real or imagined flaws U.S. space programs might have had, such as the lack of a clear focus, the lack of commitment to unambiguous long-term objectives, reliance on the shuttle (Figure 1) as the only access to space and the lack of program continuity, were well-hidden beneath the mantle of U.S. success and recognition of the nation's indisputable leadership.

A Change in Attitude

The *Challenger* accident changed all that. It represented not only a national tragedy and the loss of a critical capability, but it also represented the beginning of a gloomy era of self-examination, self-criticism and sometimes disabling self-doubt.

Faced with one disappointment after another, the United States stood aside and watched somberly while other nations forged ahead with their own space programs. Critics emerged (as they always will in the wake of a tragedy) and all of us involved in space—the National Aeronautics and Space Administration (NASA), the Department of Defense (DOD), aerospace industries and civil and commercial enterprises—were denounced equally.

Headlines from that period were disheartening. Even more discouraging were Soviet offers to launch commercial payloads on their Proton booster and their offer to sell satellite imagery at a price well below that of the legitimate commercial market competitors. Overshadowing all of that was the awareness that the Soviet space program was growing bigger and more formidable while the United States perceived its own space program as falling farther and farther behind.

National Leadership Commitment

Emerging from this era of self-examination and debate is a new national commitment to space leadership. From NASA came Dr. Sally Ride's report, "Leadership and America's Future in Space." From DOD came former Secretary of Defense Caspar Weinberger's analysis, "The Soviet Space Challenge."

Dr. Ride, on the one hand, argued for a NASA leadership strategy that maximizes U.S. capabilities. She also argued that we should develop those capabilities that would enable us to "Act independently and impressively when

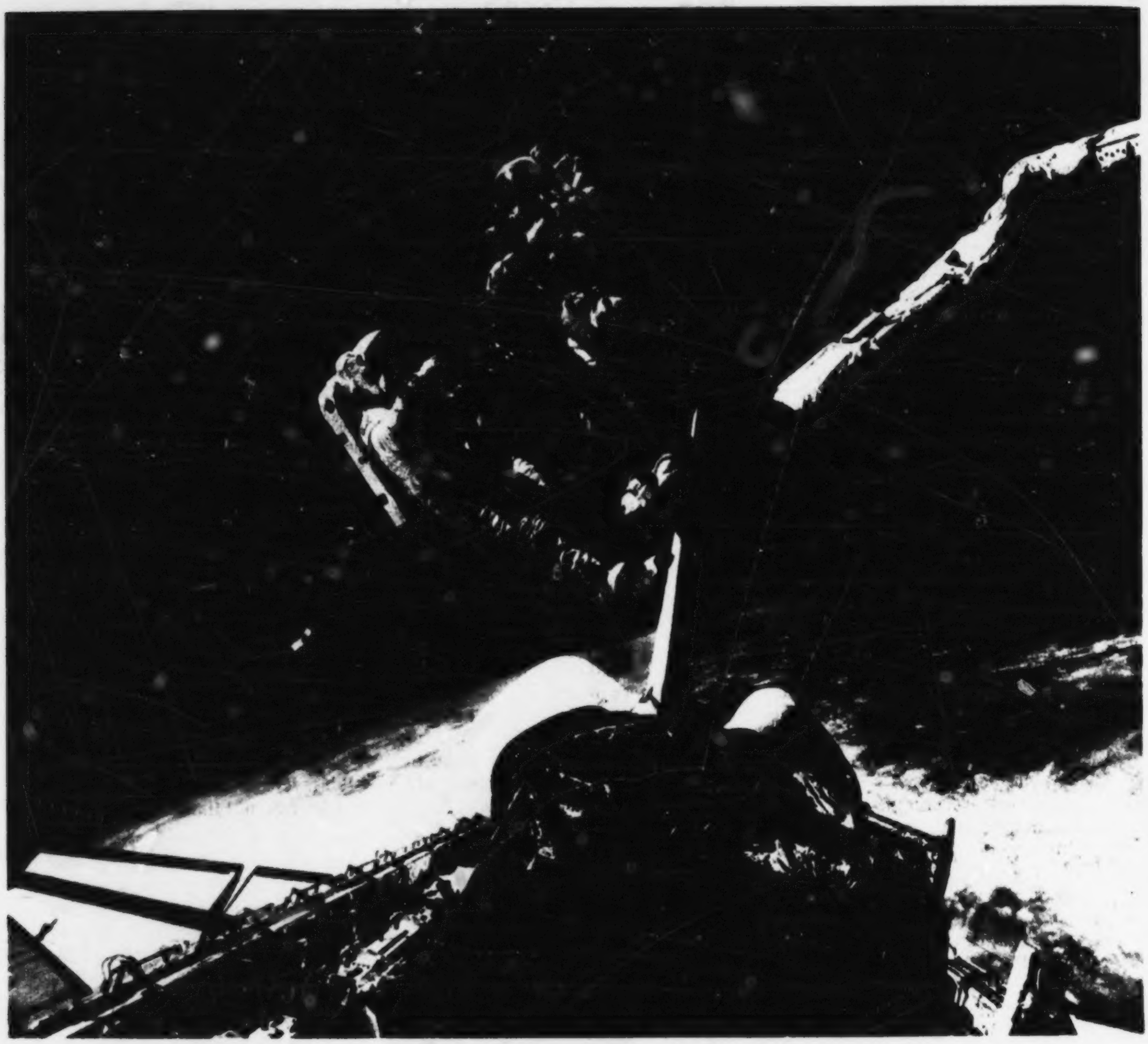

Figure 2. Space salvage Mission 51-A.

and where [our country] chooses." Former Secretary Weinberger's report flatly declared that "We must not cede space control to the Soviet Union, or to any other power, that could use it to coerce our nation or to restrict our liberties."

Thus, Dr. Ride defines leadership as the ability to do what the nation decides to do, and Weinberger defines it in much the same terms. Both definitions assert that the United States must preserve control over its own destiny and have the wherewithal to act according to its own vision.

Yet, some suggest that NASA and DOD have incompatible and irreconcilable goals, and therefore are locked in an all or nothing struggle for ascendancy, for dominance of the entire U.S. space program. The normal give-and-take dialogs between the two organizations are offered as evidence of this grand and wholly imaginary struggle.

The truth is quite different. NASA has its charter, a public law called the "National Aeronautics and Space Act of 1958," and DOD has its own charter. While the objectives of both organizations are distinct, both always have benefited from cooperation. It will be no different in the future, especially if NASA elects to pursue a program similar to the one proposed by Dr. Ride.

NASA/DOD Objectives

Dr. Ride has proposed the following four NASA leadership initiatives: evolving U.S. capabilities in low-earth orbits; exploring and expanding U.S. presence throughout the solar system; creating a lunar outpost; and conducting a discovery voyage to Mars.

None of those goals is, in my view, in any way inconsistent with the DOD mandate to provide for the national security. In fact, exploration and security have been inexorably intertwined since the great discovery voyages in the 15th and 16th centuries.

Those earlier explorations had two dimensions: First, they were both expensive and risky; and second, because they involved the expansion of the state into unknown and potentially hostile regions, they either were executed by, or safeguarded by, the military forces of the nations seeking the new world. Clearly, we cannot safely venture out on discovery voyages unless we can ensure that our explorers will be undisturbed, and to enforce, if necessary, our right of free passage through the medium of space.

Today, DOD must admit that it is short of the goal of being able to guarantee free access to, and safe passage in, space for the United States and for its allies. If space leadership is defined as the ability to act independently in space whenever we choose, or if it is defined as the ability to guarantee the right of free passage, then authentic space leadership is a quality that currently eludes us.

While both NASA's and DOD's objectives are complementary yet distinct, NASA's vision of leadership may be dependent on the ability of DOD to fulfill its kindred vision of leadership. To explore space is a noble goal, but to preserve the national security, to protect U.S. space assets, to ensure the right of free passage and to safeguard future explorers is a solemn obligation. It is an unavoidable prerequisite to pursuing more exciting goals.

This is not a devious way of saying millions for defense but not a penny for anything else. Rather, it acknowledges that the military systems and capabilities that help preserve deterrence, that protect U.S. space forces and thereby enhance the capabilities of the nation's land, sea and air forces and that would be needed to enforce right of free passage in space during a crisis constitute rock-bottom, fundamental space requirements. These are requirements that, if they are unmet, increase the risk of instability and the likelihood that deterrence might fail and, therefore, could turn all other national space priorities into vain and illusory pursuits.

National Security

I believe that, as a nation, we first must acquire the national security space capabilities that will allow us to fulfill all the other dimensions of space leadership. I also believe that we cannot acquire those basic capabilities without the support of the U.S. people or the support of the senators and representatives who translate our will into law.

National security needs must be met if we are to be able to meet any other needs. National security is paramount; all the instruments of national power are dependent on a sound economy; and these instruments spring from a nation's economic strength.

Clearly, some belt tightening is in order, and DOD will contribute more than its fair share. To minimize increased risk, a free hand is needed to make the cuts in those areas where it makes sound military sense to do so—to cut marginal and redundant programs, to eliminate low priority units and to close facilities that no longer are essential to the defense effort. Sound military sense tells us that, just as we have national security needs on the land, on the sea and in the air, we also have them in space. In this light, what are our national security needs in space?

We first need to acknowledge that the Soviet Union has its own very ambitious space goals. Toward that end, it has developed the world's largest and most responsive space infrastructure. We must be aware that it has developed space systems and a launch capability that are more than adequate for peacetime—that appear to be better suited to war fighting and war support than to anything else.

Next, we need to be aware that those Soviet capabilities that are worrisome in peacetime would become threatening in crisis or conflict. Thus, we must structure our own military space capabilities to operate effectively in an environment that would be contested in crisis or conflict.

This, in turn, requires that we acquire new launch systems and a more responsive launch capability to ensure access to space in time of peace or conflict. It also requires more robust and survivable satellite constellations. Finally, we require an authentic and fully operational antisatellite capability to deter aggression in space, and, should deterrence fail, this capability will enforce the right of free passage or disable adversarial space systems being used to support hostile action against U.S. terrestrial and maritime forces.

Pursuing Goals

With these national security needs met, the balance that existed on Earth and in space would then allow us to pursue other goals safely, such as the historic November 1984 space salvage Mission 51-A (Figure 2), in which the malfunctioning WESTAR IV and Palapa B-2 satellites were retrieved. If, however, these needs are unmet, then the idea of space leadership becomes the vain illusion of a spacefaring nation that, through weakness or misdirection, relinquished its opportunity to lead not only on Earth but beyond.

Clearly, the United States is the acknowledged leader of the Free World. I do not think it inappropriate that our vision of leadership grows in a systematic and evolutionary way to embrace leadership in space science, in space enterprise and in space exploration. But to do that, we must be resolute enough and strong enough first to create the climate of peace and stability in which our vision of leadership can be nurtured.

The choice is ours. It is a choice we are challenged to make on behalf of future generations. We should not retreat from our vision of peacefully expanding human presence into the universe, nor should we believe that the vision will become a reality if our national security needs are neglected. I am confident that we will have the courage to be faithful to our visions of leadership.

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Gen. John L. Piotrowski, USAF, is Commander in Chief, North American Aerospace Defense Command, and Commander in Chief, United States Space Command.

DEFENSE NEWS Monday, August 22, 1988

INSIDE VIEW

Antisatellite System: A Hard Choice

U.S. Development of System Would Eliminate Soviet Advantage

By Gen. JOHN L. PIOTROWSKI

History is replete with examples of nations that searched for easy answers to keep peace because they were reluctant to remain prepared for war. Many found their hopes for peace in neutrality, isolationism or unilateral disarmament. History further shows that peace can be retained by these alternatives, but the nation that selects an easy alternative often loses more than it gains. Most often, the price of an easy peace is the loss of human dignity and freedom.

Americans have experimented occasionally with these easy alternatives, but the experiences have taught the United States to reject them as false roads to peace. The United States has, in most cases, taken the steps necessary to develop and maintain the economic, political and military elements of national power essential for peace and freedom — essential for the preservation of our government and way of life.

However, it is troubling that in the recent past the United States allowed itself to be driven into a unilateral freeze on the research, development and testing of a capability essential to preserve our society's unfettered use of space. A congressional moratorium, in effect since December 1985, had restricted development of an antisatellite capability that would help deter aggression in space, defend U.S. and allied space assets and impede an adversary's control of space in wartime. Without an antisatellite capability, control of space abdicates to the Soviets in a crisis, limited conflict or war.

I am reassured, since the the congressional moratorium will be lifted Sept. 30, that the United States has come to realize that the easy road to peace is not necessarily the best road. The United States has recognized that there is a threat to its space systems and that it must move ahead with the development of its own antisatellite capability to counter this threat.

The Soviet Union has a family of antisatellite capabilities and technologies. Their most mature system is a co-orbital satellite interceptor, capable of attacking U.S. satellites in low-earth orbits. Because this interceptor is not a product of sophisticated technologies, it has often been dismissed as crude and non-threatening. The Soviets began development of this system in the 1960s, it became operational in 1971, and the Soviets have continued testing and refining the system and its components since. Its technology may be simple, but its reliability and effectiveness in taking out U.S. satellites clearly makes it threatening. The Soviets also possess direct-ascent antiballistic missiles capable of satellite intercept.

These Soviet kinetic kill antisatellite systems — the co-orbital and the direct ascent systems — are complemented by directed energy and electronic warfare capabilities. Powerful Soviet laser systems are probably capable of damaging satellite components. Soviet application of electronic warfare in support of land, sea and air forces is clearly articulated in their doctrine. Recently, the Soviets have begun discussing electronic warfare, or "radio-electronic combat" against U.S. spacecraft, adding a new dimension to an already worrisome and threatening family of antisatellite capabilities.

Soviet military doctrine postulates control of space as a military necessity equal to control of the land, sea and air. The Soviets fully integrate space into their combined arms warfighting plans and have stated that victory on land, sea or in the air depends on control of space. Furthermore, Soviet leader Mikhail Gorbachev has declared that the

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Gen. John Piotrowski is commander in chief of the North American Aerospace Command and the United States Space Command.

Soviet Union does not intend to lose its "vanguard position" in the conquest of space. Faced with such clearly articulated Soviet intentions and the impressive arsenal of antisatellite capabilities that have emerged to satisfy them, it would not be prudent to trust that the Soviets would not employ their antisatellite forces to exercise control of space should deterrence fail.

Why is an antisatellite capability essential to protecting the security of the United States? The answer is derived from the three fundamental purposes of U.S. military forces: deter aggression, defend national interests and prevail in times of conflict. Meeting each of these national objectives is critically dependent on the United States' ability to operate in space.

As in all issues related to deterrence, at the center is the potential enemy's perception of the expected gains of aggression, weighed against the probable costs. As the Soviets view the current balance in space, they may see many high-value targets — satellites critical to deterrence and to the application of the military element of national power — and very low costs associated with any aggressive action against these systems. The U.S. ability to make Soviet aggression in space costly to them is very limited. The United States does not have the physical means to respond in kind to a Soviet attack against U.S. spacecraft. An antisatellite capability would bring the deterrent ledger into closer balance and give the United States the ability to defend its commercial, civil and military assests in space.

While deterrence is the United States' desired outcome, the country must be prepared to respond should deterrence fail. Space assets are critical to the success of U.S. military strategy. They provide all U.S. military forces with warning, surveillance, communication, navigation and environmental support. This information is absolutely essential to the employment of our forces at the right time, in the right place and in controlled, measured ways. Without the support provided by our space-based assests, U.S. land, sea and air forces are severely restricted, and the risk to those soliders, sailors, airmen and Marines who must implement military plans is greatly increased.

Being able to defend U.S. space-based assets could greatly reduce the risk to U.S. and allied forces by ensuring the support they need from space is available. An antisatellite capability could, in some cases, allow the United States to defend against attacks on those essential space assets. It also would allow the United States to defend against attacks on those essential space assets. It also would allow the nation to hold at risk or attack the foe's war-supporting spacecraft.

The final argument for an antisatellite capability revolves around the basic goals or our military strategy — controlling escalation, prevailing and terminating a conflict quickly and under favorable circumstances. A space negation capability would contribute to these goals by providing the option to take the battle to the enemy — attacking its satellites that provide tactical and strategic advantages to its land, sea and air forces. The Soviets integrate space into their combined arms operations. They use space to improve the effectiveness of their military forces. The ability to attack the Soviets' critical spaced-based assets enhances deterrence because it raises the risk they would incur if they attack U.S. satellites. A U.S. antisatellite capability could remove the advantage Soviet space systems provide and could significantly affect the outcome of the land, sea and air battles.

Throughout history, Americans have taken the hard decisions necessary to preserve the U.S. government and society. The United States has developed military forces and employed them to achieve vital national objectives when those objectives could not be achieved by other means. The United States has responded around the world to threats against the welfare of the country, its citizens and its society. The importance of space to our society and to the economic, political and military elements of power is expanding constantly. Once again the United States must choose the hard alternative — it must develop an antisatellite capability to guarantee the right to use space in peacetime and conflict.

Space Trace
August 26, 1988

Anniversary nears for both commands

NORAD

by General John L. Piotrowski,
Commander in chief,
North American Aerospace Defense Command

September 12, 1988, marks the thirty-first anniversary of the North American Aerospace Defense Command — a binational partnership like no other in the history of the world.

More than three decades have passed since NORAD began operations at Ent AFB, Colo., on September 12, 1957. While a great deal has changed over that time, one fact remains constant — the enduring and present Soviet threat to North America. The Soviet strategic arsenal has grown to threaten North America from the depths of the oceans to the outer reaches of space.

Events of the last 31 years have proven that the decision by our two governments to form NORAD was and remains a wise and prudent act. The mutual cooperation which has been the strength of NORAD's 31 years is a source of gratification to the citizens of our two nations. It is also a credit to the thousands of American and Canadian service men and women who have upheld the NORAD standard and served at sites which span the continent.

On behalf of our two grateful nations, it is my pleasure to offer to the men and women who have served or are now serving in NORAD my sincere thanks for their contributions to this most important and solemn endeavor — the defense of our homelands, this great continent whose security is held in our trust.

USSPACECOM

by General John L. Piotrowski,
Commander in chief, U.S. Spacce Command

The United States Space Command was established on September 23, 1985, as the single unified command to integrate the space requirements of all the commanders in chief and to achieve unity of effort among service components in accomplishing our assigned missions. In short — we're in the business to support the warfighters in the field.

As we celebrate our third anniversary, it's appropriate to recognize the dedication and hard work of all which have made possible improvements in our nation's military space posture. Some of those achievements include bringing the worldwide CINC's requirements to Congress, accelerating launches of DSP, DMSP, and transit, activating the USSPACECOM command center, and improving operations to provide enhanced warning and better tactical support to the unified and specified commands. In addition, negotiations for the Fylingdales BMEWS radar upgrade have been completed, a concept of operations for a phase I ballistic missile defense capability has been developed, and operational requirements and mission need statements for new space capabilities have been approved. This is an impressive list — you can be proud of our accomplishments in the past three years.

As we reflect on the progress we've made, let us recommit ourselves to meeting the challenges of the future by looking further and reaching higher to defend our national values and maintain the liberties we cherish.

FROM THE CINC STANDPOINT

Space Evolution

By Gen. John L. Piotrowski, USAF, Commander in Chief
North American Aerospace Defense Command and
United States Space Command

THE MILITARY space community currently is in the midst of a subtle, natural evolution. It appears subtle because only those few thousand people directly involved in space systems plans, policy and operations actually are aware of the changes that are underway. Nevertheless, a natural process of maturing space operations from a research and development orientation to an operational mode for employment of U.S. space based resources is underway.

Any evolutionary process is difficult to recognize. In the case of military space operations, many indicators exist, such as national and Department of Defense (DOD) policy statements, increased public awareness, newly created operational organizations and proposed changes to spacecraft and booster production and checkout and launch efforts.

The National Space Policy, issued in January 1988 by President Reagan, recognizes the vital role that space systems perform in achieving U.S. national security objectives. Space systems provide communications, navigation, environmental monitoring, early warning and surveillance and, in some cases, represent the only way to accomplish these critical missions. This policy statement articulated five elements that form the basis of U.S. military space policy.

Space Policy Elements

The first element is the same theme that prevails throughout U.S. military strategy—deterrence is the primary goal. Space based systems contribute greatly to deterrence, and, therefore, critical space systems must be made available to commanders commensurate with their need. The second element of U.S. national space policy is the objective of ensuring free access to space and uninterrupted operations in space for all nations in a manner analogous to the way that free access to the Earth's oceans is ensured. The military forces must develop and maintain the means to provide ensured mission capability for those activities performed in space. The third element of the policy encourages the interaction, where appropriate, among civil, commercial and military space programs; to pool all resources; to share critical technologies; and to expand research rather than duplicate U.S. technological developments. The fourth element provides for improved defensive capabilities to deter or, if necessary, defend U.S. space systems from enemy attack. Finally, the fifth policy element is a commitment to further improve those space systems that directly support U.S. military forces and national security goals.

The DOD policy statement details and expands the five elements of the National Space Policy. The DOD Space Policy not only sets specific objectives, but clearly reiterates that space activities are critical to national security. The DOD policy calls for "assured mission capability," which I translate to mean a proper balance of robust constellations, increased survivability, adequate and responsive launch facilities, redundant satellite control segments and war reserve stocks of on-orbit or ready-to-launch spares. The policy also establishes the objectives of exploring the potential of military man in space activities, developing new technology to increase performance while lowering cost and supporting the Strategic Defense

Initiative (SDI). Finally, the DOD policy calls for developing a space control capability at the earliest possible date. Developing this capability requires public support and, therefore, increased public awareness.

Public Awareness

The U.S. antisatellite system (ASAT) was developed originally as an air launched miniature homing vehicle that has been built and tested four times—once against a target in space. During the Capitol Hill debate in 1985, however, a ban on further testing and operational deployment of a U.S. ASAT was imposed by Congress, leaving the United States with no deterrent capability. It was not until spring 1988 when a greater awareness of the Soviet ASATs and the threat they pose to U.S. systems led to the lifting of the ban on testing a space control system. Many factors led to this reversal, including the space shuttle *Challenger* disaster and the successes of the Soviet space program.

Since the *Challenger* disaster in 1986, the public has been exposed to U.S. inability to launch spacecraft into orbit, which underscores the critical importance of maintaining the existing space force structure. The inability—coupled with the Soviets' success in launching, replenishing and re-manning their Mir space station as well as their unprecedented commercial offer to launch foreign payloads and perform experiments onboard their orbiting systems—has highlighted the disparities in the launch infrastructure, the deployment philosophies and the space control or ASAT capabilities of the two countries. This public awareness must continue to increase, especially as the United States is forced to make difficult funding decisions.

Not only has general public awareness increased, but within the military structure, more emphasis has been placed on enhanced survivability, operational exploitation and a transfer of responsibility from development commands to operational ones. The result has been establishing operational space commands for each of the military departments, normalizing requirements and creating a single advocate—a unified U.S. Space Command—for space operations in support of the National Command Authorities, the other unified and specified commanders in chief, NATO and the North American Aerospace Defense Command. The long-term objective is integrating space systems into U.S. combined arms doctrine to enhance the effectiveness of terrestrial, airborne and maritime forces. This natural evolutionary process will lead the United States to improve the readiness of its space infrastructure and operate its space systems in ways that significantly improve the ability to exploit the unique coverage and geographical access capabilities of space based systems.

A Growth in Technology

Over the years, the United States has developed and applied tremendous technology to its space systems at a rapid pace. Current space systems, in most cases, bear little resemblance to their predecessors in terms of capability and reliability. Historically, the U.S. approach in applying technology for space systems has been focused on expanding the capability and capacity of specific systems. But the evolutionary process must now move the space community toward applying the four pillars—readiness, sustainability, force structure and modernization—which are applied to all military forces. The evolution or maturation of the employment and deployment of space systems will lead to more robust constellations and larger numbers of launch pads capable of launching multiple boosters and payloads within days instead of months. U.S. technology has resulted in tremendously capable, multimission satellites with long life spans and extremely reliable performance. Consequently, there are very few satellites in number, and each possesses a high operational value with a low margin for failure or combat attrition. These satellites also represent lucrative targets for Soviet ASATs. The evolutionary process, then, should lead to ready-to-launch, on-orbit spares and war reserve stock to sustain the force during periods of crisis and war, as well as defensive capabilities for spacecraft.

Space systems are composed not only of launch facilities and spacecraft but also of command and control (C^2) facilities and the communications links themselves. U.S. space systems must evolve into fully protected, antijam data and telemetry, tracking and commanding links, as well as redundant, survivable control segments. Because space forces must be directed solely through these C^2 links, the system's availability and continued use are highly dependent on these fragile communications links and the C^2 sites that generate them.

The production, checkout and launch of U.S. space systems is an area where huge benefits can be obtained by ensuring the readiness and sustainability of U.S. constellations. The current processes are characterized by an almost complete dependence on nonmilitary personnel, unique documentation and training requirements and the practice of vertical checkout on the launch pad. As the United States matures toward truly operational systems, it must develop assembly line production techniques, standardized documentation and training and simplicity in checkout and launch preparation.

Conclusion

As President John F. Kennedy said, "If the Soviets control space, they control the Earth, as in the past centuries the nations that controlled the seas dominated the continents." We must prepare our nation to control space, if necessary, to meet economic, technological, political and military objectives. To do this, the proper force structure must be ensured, including deterrent and defensive capabilities. We also must increase the public awareness of the Soviet threat and its impact on our way of life. And, finally, the military space force structure must be allowed to mature into an operationally ready, maintainable, sustainable force that is as survivable as the forces it supports.

Our goal remains to use space to ensure our security and the security of our Allies and our friends. Meeting that goal will require increased public awareness, cooperation among military departments as well as all the national and international agencies involved in space. We are moving toward that goal in a measured, evolutionary way.

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SPACECRAFT·MISSIONS·TECHNOLOGY

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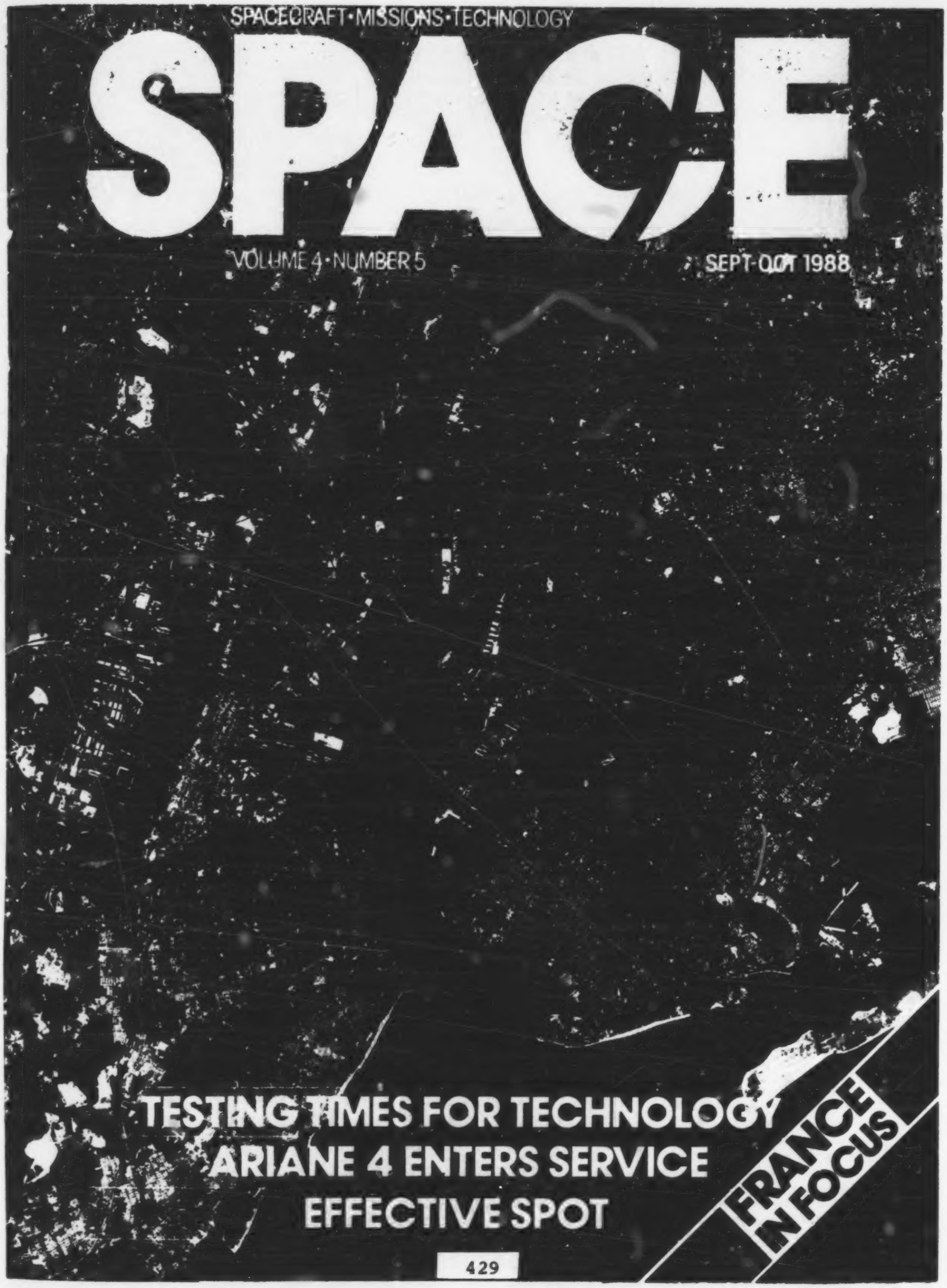


TESTING TIMES FOR TECHNOLOGY
ARIANE 4 ENTERS SERVICE
EFFECTIVE SPOT

FRANCE
IN FOCUS

The USA must develop its military strength in space so that its civil programme can proceed unhindered.

PIONEERING THE LAST FRONTIER

by General John L Piotrowski

Above: [illegible]

Right: [illegible]

Is the United States' quest for 'space leadership' illusory and vain . . . or is it attainable and visionary? The subject of 'space leadership' has been at the centre of a maelstrom of debate since the Challenger was lost over two years ago.

In the 25 years prior to the Challenger tragedy the US had become used to being the world's leader in space. Our accomplishments had been nothing short of spectacular, whatever real or imagined flaws our space programmes might have had. Flaws such as the lack of a clear focus, the lack of commitment to unambiguous long-term objectives, relying on the Shuttle as our only access to space, even a lack of continuity were all well-hidden beneath the mantle of our undeniable success and recognition of our indisputable leadership.

The Challenger accident changed all that. It represented not only a national tragedy and the loss of a critical capability, but also the beginning of a gloomy era of self-examination, self-criticism, and sometimes nearly disabling self-doubt.

Faced with one disappointment after another, we had to stand aside and watch while other nations forged ahead with their own space programmes. Finger-pointers and nay-sayers came to the fore – as they always will in the wake of a tragedy – and all of us involved in space – NASA, the Department of Defense, aerospace industries, and civil and commercial enterprises – were tarred with the same brush.

The disheartening headlines of the period are familiar: 'US ten years behind Soviets, says editor of *Jane's Spaceflight Directory*,'; 'Moscow takes the lead,'; 'US space programme grounded,'; and 'Sally Ride says, US has lost leadership.'

Even more discouraging were the Soviets' offers to launch commercial payloads on their Proton – and now their offer to sell satellite imagery at a price well below that of the other commercial competitors in the market. And, of course, above all was the worrisome awareness that, as we perceived ourselves falling farther and farther behind, the Soviet space programme was daily growing bigger and more formidable.

Emerging from this era of self-examination and debate – and I believe it is high time we emerge from it – is a new commitment to space leadership. From NASA, came Sally Ride's outstanding and insightful report, *Leadership and America's Future in Space*. From the Department of Defense came former Secretary of Defense Weinberger's lucid and compelling analysis, *The Soviet Space Challenge*.

Dr Ride, on one hand, argued for a NASA leadership strategy that maximises the capabilities we have and that we develop these capabilities to enable us to, 'act independently and impressively when and where (our country) chooses'.

Former Secretary Weinberger's report flatly declared, 'We must not cede space control to the Soviet Union, or to any other power, that could use it to coerce our nation or to restrict our liberties.'

Dr Ride defines leadership as the ability to do what our nation decides to do, and Mr Weinberger defines it in much the same terms. Both assert that our nation must preserve control over its own destiny . . . and have the wherewithal to act according to its own vision.

Irreconcilable goals

Yet, some suggest that NASA and the Department of Defense have incompatible and irreconcilable goals, and are destined to be locked in some kind of 'all or nothing' struggle for ascendancy; for dominance of our nation's entire space programme.

The normal give and take dialogues between the two organisations – dialogues that are and always have been central to doing business – are

offered as evidence of this grand and, I believe, wholly imaginary struggle.

The truth is quite different. NASA has its charter – a United States' public law called the 'National Aeronautics and Space Act of 1958' – and the Department of Defense has its charter. While the objectives of these organisations are distinct, both have always benefited from the synergy that results from co-operation. It will be no different in the future, especially if NASA elects to pursue a programme similar to the one proposed by Dr Ride.

She has proposed four NASA leadership initiatives: evolving our capabilities in low-Earth orbits; exploring and expanding our presence throughout the Solar System; creation of a lunar outpost; and a voyage of discovery to Mars.

None of these goals are, in my view, in any way inconsistent with the Department of Defense mandate to provide national security. Exploration and security have been inexorably intertwined since the great voyages of discovery undertaken by our European forbears in the fifteenth and sixteenth centuries.

Free passage

Earlier explorations had two dimensions that should be kept in mind. Firstly, they were simultaneously expensive and risky, and secondly, because they involved the expansion of the state into unknown and potentially hostile regions, they were either executed by, or safeguarded by, the military forces of the nations seeking the new world.

Clearly, we cannot safely venture out into the new ocean of space on voyages of discovery unless we can ensure that our explorers will be undisturbed – to enforce, if necessary, our right of free passage through the medium of space.

And today, we in the Department of Defense must admit that we are short of the goal of being able to guarantee free access to, and safe passage in space, for ourselves and for our allies. If space leadership is defined as the ability to act independently in space whenever we choose – or if it is defined as the ability to guarantee the right of free passage – then authentic space leadership is a quality, or a status, that I regret to say presently eludes us. ▶

I believe that, while NASA's obectives and the Department of Defense's objectives are complementary yet distinct, NASA's vision of leadership may be dependent – in a very real and very direct way – on the ability of our nation's Department of Defense to fulfil its kindred vision of leadership.

To explore space, to roll back frontiers and visit the planets, is a noble goal, a lofty quest. But to preserve the national security, to protect our space assets, to ensure the right of free passage, to safeguard our future explorers, is a solemn obligation, an unavoidable prerequisite to meeting or even pursuing more exciting goals.

This is not a devious way of saying 'millions for defence, but not a penny for anything else'. Rather it is meant as an acknowledgment that the military systems and capabilities that help preserve deterrence – that protect our space forces and thereby enhance the capabilities of our land, sea, and air forces that would be needed to enforce our right of free passage in space during a crisis, conflict, or war – constitute our rock-bottom fundamental space requirements. Requirements which, if they are unmet, increase the risk of instability and the likelihood that deterrence might fail. It could turn all other national space priorities into vain and illusory pursuits.

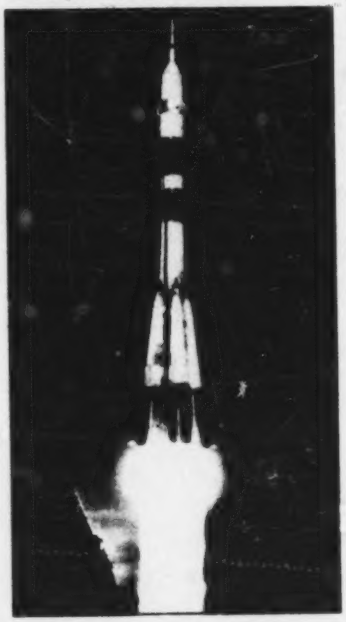
I believe that, as a nation, we must first acquire the national security space capabilities that will allow us to fulfil all the other dimensions of space leadership. We cannot acquire those basic capabilities without the understanding of our allies and, more importantly, the support of the American people. We require the Congress – the Senators and Representatives that translate our will into law and that give us NASA and the Department of Defense – the wherewithal to turn our visions into realities.

Space security

National security needs are the fundamental needs that must be met if we are to meet any other needs. (Having asserted that national security is paramount I am also in agreement with those who assert that all the instruments of national power are dependent on a sound economy, and spring from a nation's economic strength.) Sound military sense tells us that, just as we have national security requirements on the land, on the sea, and in the air we also have them in space. What are our national security needs in space?

We have to acknowledge that the Soviet Union has its own very ambitious space goals. The Soviets have developed the world's largest and, by a wide margin, most responsive space infrastructure. We must be aware that they have the military space doctrine which has caused them to develop space systems and a launch capability that are, in my opinion, more than adequate for peacetime, but that appear to me to be better suited to warfighting and war support than to anything else. According to Secretary of Defense Frank C Carlucci, 'Soviet military space doctrine holds that "mastery of space [illegible] an important prerequisite for achieving victory in war." We assess that the Soviets' space objectives for supporting this doctrine are: attaining and maintaining military superiority in outer space; denying the use of outer space to other nations; and assuring maximum space-based military support for Soviet offensive and defensive combat operations on land, sea, air, and in space.'

America estimates that the Soviet Union could reconstitute its entire satellite network in two or three months. The USSR has offered its Gorisont communications satellite (**above**) to the West indicating good availability and Soyuz flights (**below**) occur with great frequency. Technology lag in the Soviet Union makes frequent launches necessary, but this also provides flexibility.



The Soviet space capabilities that emerge from and serve this doctrine are a matter of concern. Of the Soviet space systems currently orbiting the Earth, we believe that a full 90% have military or military-supporting functions. These include systems which appear to be specifically designed to locate and target US and Allied terrestrial and maritime forces – foremost among which are the Electronic Intelligence Ocean Reconnaissance Satellite (EORSAT) and the Radar Ocean Reconnaissance Satellite (RORSAT). In any conflict involving the reinforcement of Europe, these systems could be used to locate transitting convoys and ships of the line for targeting by Soviet naval bombers, surface combatants, and submarines armed with long-range standoff weapons. The nations of the Alliance have no similar capability.

The Soviet launch infrastructure – while perhaps originally designed to cope with Soviet technological deficiencies in spacecraft design and durability – represents a superior asset in crisis or conflict. This system is so robust that, unlike our own, it is largely insensitive to failure. In fact, Secretary of Defense Frank C Carlucci noted in his *Annual Report to the Congress* that, should the Soviets suffer the loss of 'their entire satellite network, they could reconstitute it completely in two to three months' assuming the availability of the necessary payloads and boosters.

Former Secretary of Defense Weinberger said, 'One of the most impressive Soviet accomplishments is their massive launch capability. Indeed they appear to be building a launch capability that exceeds projected requirements significantly. And it includes the kind of rapid launch and reload abilities needed to attack our satellites and regenerate space assets lost during war. In short, the Kremlin appears to have focused its space efforts to support and conduct combat operations.'

Soviet potential

While robust launch capability for rapid replenishment has great utility in war, it also satisfies Soviet peacetime needs. Soviet antisatellite systems, however, have their highest utility in conflict.

The Soviets have an operational antisatellite interceptor which has been operational since 1972. This conventionally armed, co-orbital satellite interceptor is launched to orbit in the same plane as the victim satellite. At the appropriate time it closes on the target satellite and detonates its fragmentation warhead to destroy the victim satellite. This system, however, represents only one of at least four antisatellite technologies available to the Soviets. Others include direct ascent interceptor missiles, high energy lasers, and electronic warfare.

The 'GALOSH' antiballistic missile interceptor has an inherent antisatellite capability against low-altitude satellites. Soviet ground-based lasers at Sary Shagan may be capable of damaging some US satellites in orbit. The Soviets are also technologically capable of conducting electronic combat against US space systems.

While the Soviets publicly eschew what they call the 'militarisation of space', Soviet military research and development, for every year since 1972, has exceeded that of the US. It is currently 25% greater and we estimate that the Soviet Union has devoted to its space programmes more than 60% of that expended on its strategic forces.

On the horizon we see more Soviet systems with antisatellite potential. These include radio frequency (RF) weapons, the potential for airborne and space-based lasers, particle beam weapons, and perhaps even capture or intercept capabilities residing in a Soviet space shuttle or space plane.

Our first need is not to underestimate the significance of Soviet doctrine and Soviet space capabilities. This need is, in my opinion, still largely unmet.

Next, we need to be aware that those Soviet capabilities that are worrisome in peacetime would become threatening in conflict. The US must structure its military space capabilities to operate effectively in an environment that would most assuredly be contested in a crisis.

This requires that we acquire new launch systems and a more responsive launch capability to ensure access to space in peace and conflict. It also requires more robust, more survivable satellite constellations. And, finally, we need an authentic and fully operational antisatellite capability to deter aggression in space – and, should deterrence fail, to enforce our right of free passage or disable the space systems that an adversary is using to support hostile action against our terrestrial and maritime forces.

Visions of peace

With these national security needs met, the balance that existed on Earth and in space would then allow us to safely pursue our other goals. If, however, these needs are not met, then the idea of space leadership becomes the vain illusion of a space-faring nation that through weakness or misdirection relinquished its opportunity to lead, to discover, to do good – not only here on Earth, but beyond.

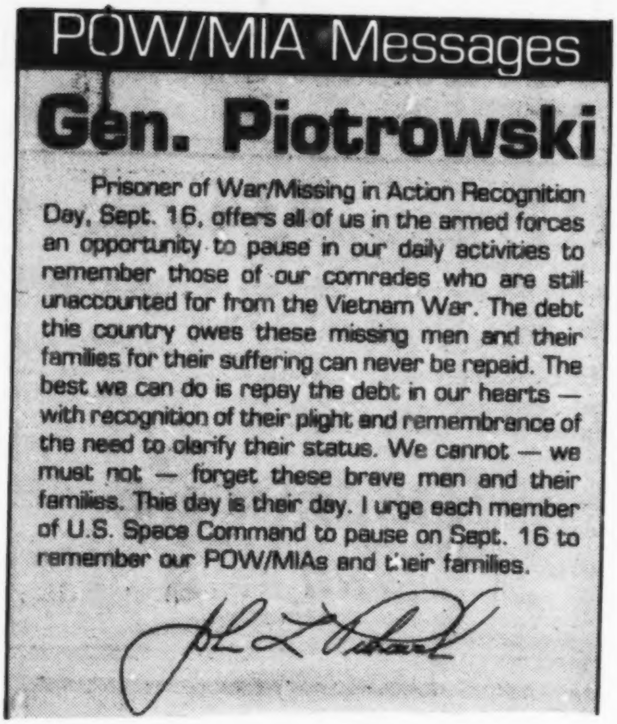
The United States ranks high among the acknowledged leaders of the free world. I do not think it inappropriate that our vision of leadership grows in a systematic and evolutionary way to embrace leadership in space science, space enterprise and space exploration. But to do that, we must be resolute enough and strong enough to create the climate of peace and stability in which our vision of leadership can be nurtured.

The choice is ours. And it is a choice we are challenged to make on behalf of future generations. We should not retreat from our vision of peacefully expanding human presence into the universe, nor should we be so vain as to believe that the vision will become a reality if our national security needs are neglected. I am confident that we will have the courage to be faithful to our visions of leadership. Ø

About the author

General John L Piotrowski is Commander in Chief North American Aerospace Defense Command and Commander in Chief United States Space Command. The opinions expressed in this article are not necessarily those of Space *magazine. A response article from the Soviet Union is expected.*

THE SPACE OBSERVER
THURSDAY SEPTEMBER 15, 1988



POW/MIA Messages

Gen. Piotrowski

Prisoner of War/Missing in Action Recognition Day, Sept. 16, offers all of us in the armed forces an opportunity to pause in our daily activities to remember those of our comrades who are still unaccounted for from the Vietnam War. The debt this country owes these missing men and their families for their suffering can never be repaid. The best we can do is repay the debt in our hearts — with recognition of their plight and remembrance of the need to clarify their status. We cannot — we must not — forget these brave men and their families. This day is their day. I urge each member of U.S. Space Command to pause on Sept. 16 to remember our POW/MIAs and their families.

PRESS & Art PACK
OCTOBER 17, 1988

National Defense

The Military In Space

By Jim Garamone
American Forces Information Service

New systems, the need for an American anti-satellite capability and the effect of the Strategic Defense Initiative were among items addressed during an interview with the commander of the U.S. Space Command.

Air Force Gen. John L. Piotrowski also spoke about the first three years of the command and the acceptance of the worth of the organization by other commanders.

Piotrowski said it was only logical for the U.S. Space Command to be formed. Impetus to share space assets among services has grown stronger as budgets have become more constrained and space equipment and vehicle costs more expensive. Understanding of the command's mission has increased. "(We) have an increasingly greater meaning to people in the field," said Piotrowski. "It has taken some time for my fellow (commanders) and subordinate component commands to realize that we are a war-fighting command like they are."

The wartime and peacetime missions of Space Command are very similar, according to Piotrowski. The difference is a matter of degree. Piotrowski gave a hypothetical example of the types of missions performed by Space Command. "With the increase in activity in the Persian Gulf, the (commander in chief of) Central Command might decide that the links established to that part of the world were inadequate," said Piotrowski. "In that case, he would go to the (Joint Chiefs of Staff) and request additional communications. That mission would come to us.

"We would look at the constellations of satellites available to us and come up with a recommendation," he continued. "It may be that we could maneuver a spacecraft from one position to cover the area. It may be that another satellite would have to be launched and placed into orbit."

Another example Piotrowski used dealt with minesweeping. He said the use of the Global Positioning System was very helpful in clearing the Persian Gulf of mines. Accuracy is important to this kind of effort, and with the use of the system, ships were able to get navigational fixes within 15 meters. "The problem before was that ships would lay out a line, but then not be sure they were accurately following it. We were able to provide prototype equipment to the Navy minesweepers so they were able to more quickly and more efficiently sweep the waters," he said.

"Putting it all together, we want (commanders in chief) to be able to posture their forces in the right numbers, at the right places and at the right time," Piotrowski said. "We do that in peacetime and wartime, but we would do far more of it during war."

The threat of a Soviet anti-satellite arsenal concerns Piotrowski. "For the first 15 years in space, there was no threat," he said. "For the next 15 years, it was believed the threat was not significant. Today, I believe the Soviets have every intention to fully develop and deploy an arsenal of weapons that could sweep our satellites out of the sky—whether it's in hours or days is immaterial. I'm absolutely convinced they are moving toward that objective."

Piotrowski favors a promising system based on kinetic energy that he envisions as a joint program providing an anti-satellite capability to negate Soviet satellites. "The ASAT capability could help deter the Soviets from ever attacking our spacecraft," he said. "But if they did, we would be able to respond in kind."

Piotrowski strongly supports another system—a space-based radar. "We looked at what forces confront us—the Soviets, North Korea, Libya and other nations—and counted up well over $350 billion worth of naval and air assets," he said. "Warships and aircraft could easily be tracked by radar in space."

Piotrowski said a space-based radar would make those $350 billion worth of warships and aircraft less effective because the United States would be able to pinpoint their location at any time with a system costing much less. "Whenever a Soviet aircraft takes to the sky, you know where it is, where it came from and—by how long it flies—whether it is a tactical or strategic system," he said. "That's tremendous leverage. To me, that's competitive strategy."

MORE →

Piotrowski said the United States already possesses the technology to make the system work.

All of these projects tie into a policy called "assured operations in space." This includes launching equipment into space and operating it while it is in orbit. "The successful main engine test of the shuttle is encouraging," he said. "The shuttle is an important part of our mission in space."

One point that makes assured operations in space more difficult is the lack of a common base between American boosters and the shuttle. Piotrowski said the United States mates specific boosters with specific satellites. "That's all right, if you have no need for speed," he said. "It's uneconomical to put a 3,000-pound satellite on a booster capable of lifting 16,000 pounds, but that's what we may have to do during war."

If a satellite is shot down and a replacement needs to go into space, then the United States should be able to put it on whatever booster is standing by. "If we had to send a small cargo to another country very quickly and the only aircraft available was a C-5 (the largest aircraft in the Air Force inventory), we would do that," Piotrowski said. "We don't do that in space. We need to develop a family of boosters—Titans, Atlases, Deltas, etc.—that have common connectors, mounting rings, processors and software so we can pull a satellite off a booster and place another, more urgently needed one in place."

Space Command is also acting as the "surrogate" command for the Strategic Defense Initiative. Space Command develops operational requirements and concepts for the program. Piotrowski said he is not disappointed by discussion on deployment of SDI, but he is with the "demagogic" arguments that have been raised. "I think honest and reasoned debate is the strength of this nation," he said. "I believe that honest and reasoned debate would lead to a decision to deploy (SDI systems)."

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By Graham Wragg

Cover painting of Halifaxes returning from a mission over Germany during WWII. The Halifax was beloved of all 6 Gp bomber crews, who defended it as equal to, or, better than the more famous Lancaster.

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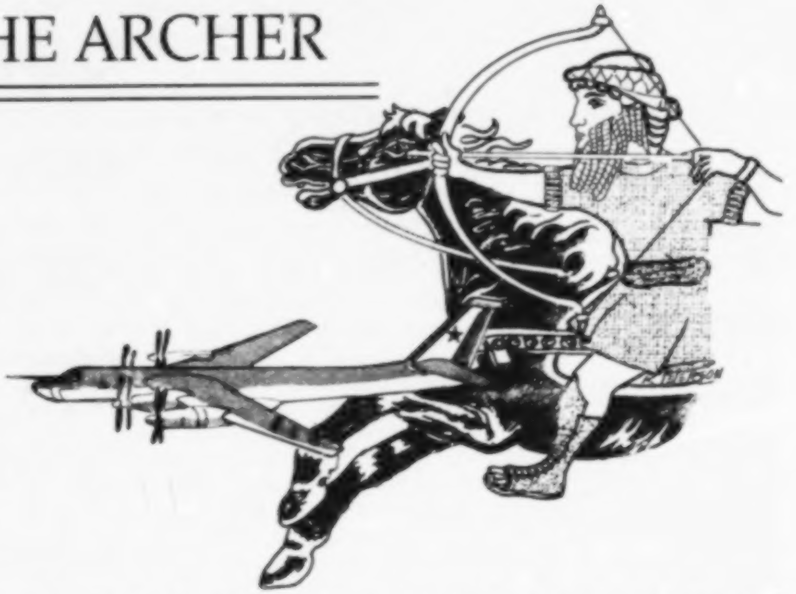
SLAYING THE ARCHER

BY GEN JOHN L. PIOTROWSKI, USAF

C-in-C, North American Aerospace
Defense Command
and
C-in-C, United States Space Command



On 26 Aug 1346, near the village of Crecy-en-Ponthieu, a force of English yeomen defeated an army three times its own size. Historians record that an important contributor to the success of the English was an innovation known as the "longbow." Not only did the longbow send an arrow out to a lethal range of over 250 metres, but each bowman could sustain an astonishing rate of fire of one arrow launched every five or six seconds.

LESSONS

Three enduring lessons emerged from the Battle of Crecy. First, standoff weapons provide tremendous advantages to the force employing them and significant challenges to the force facing them. Second, and closely related to the first, is the lesson that it is always more effective to slay the archer and kill the arrows at their source, than it is to merely defend against the individual arrows. There is a third lesson, but it has to be underscored periodically, and that is that technologically superior weapons — effectively assimilated into tactical operations — can affect the course and outcome of battles. The corollary is that defensive systems and defensive tactics have to continuously evolve to effectively counter new threats.

This article is about some present-day applications of the first two lessons to the mission of air defense. I will return to the third lesson later.

ADVERSARY

There should be no doubt as to whom our principal adversary is: the Soviet Union. The five air armies of that country are large, well armed, and well practiced. Their force of bombers includes over 165 operational Bears and Bison, some 160 Backfires, over 400 medium-range Blinders and Badgers, and over 450 Fencer a/c. Some 130 Backfires and 240 Badgers and Blinders are allocated to Soviet Naval Aviation. And, of course, the long range Blackjack bomber is waiting in the wings. Although all of these forces do not pose an immediate air threat to North America, the longer range systems clearly do.

This strike force is supported by a complement of some 530 aerial refueling tankers, reconnaissance a/c, and airborne electronic warfare platforms.

Soviet bombers are the "archers" and cruise missiles are the "arrows." Today, the most threatening arrow is clearly the AS-15 cruise missile, and it is carried in the quiver of the Bear H bomber. This subsonic, low-altitude cruise missile allows the bomber to standoff some 3,000 kilometres and strike its targets. Nearly 60 of the Bear H a/c — with an unrefueled combat radius of over 8,000 kilometres — can be armed with these nuclear cruise missiles. They present, by any standard, a serious threat to North America.

RESPONSIBILITIES

As the Commander in Chief of the North American Aerospace Defense Command (NORAD), I have responsibilities for the air defense of North America that are discharged by the air defense forces of Canada and the United States. Both of our nations are concerned over the arrows; both must be prepared to slay the archer. There is, however, at least one major difference.

Canada is closer to the threat than the continental United States. If deterrence fails, militarily significant targets in Canada may very well be among the archer's first targets. Thus, the operational procedures, the tactics, the rules of engagement, and even the exercises are all illuminated by a special urgency for Canada's NORAD air defense forces.

Week after week, and with what appears to be increasing frequency, I watch the Bears make their transit. Sometimes they turn south and face the United Kingdom, sometimes they probe Iceland's defenses, and sometimes they travel all the way to well within threatening range of North America — approaching both from the east and the west. Clearly, these look like nothing else but proficiency training sorties for crews dedicated to the strategic nuclear attack mission.

These provocative acts stand in stark contrast to the rhetoric of "glasnost." Imagine the hue and cry that would be raised on both sides of the Iron Curtain, if the United States' strategic bombers — B-1s or B-52s — or the United Kingdom's Tornadoes flew similar profiles! But they do not. Ours is not the role of aggressor, it is the role of defender.

WARNING

As defenders we must be ready to slay the archer. Timely warning, a strong command and control tether, forward basing, airborne intercept control a/c, tankers to ensure endurance, and good aircrews are all essential. But so are the unsung heroes: weapons controllers; ground support personnel; communicators; and a crack intelligence staff. All must be good because it is very likely the atmospheric threat will continue to grow.

While any future fair and verifiable reductions in the Soviet nuclear intercontinental ballistic missile (ICBM) force must be seen as a positive thing, we should not be lulled into believing the Soviets will concede a strategic advantage to the West. Rather, we should expect that the threat will alter its form — that the number of Soviet bombers and the number of cruise missiles will grow. It would also be prudent to prepare for significant improvements in the capabilities of the Soviet bomber force and the incorporation of advanced technologies into the cruise missiles they build to carry to North America.

As a consequence, NORAD continues to posture for the future. An important goal is to increase the warning time available to defenders. For North America we are building the Over-the-Horizon Backscatter Radar, or OTH-B. The OTH-B radar energy is bounced off the ionosphere back to the earth to illuminate targets at ranges from 850 to 3,000 kilometres. Received signals are back scattered by another hop of ionosphere reflection.

When fully operational, the OTH-B will provide atmospheric radar coverage around the entire periphery of North America, except directly to the North where perturbations in the ionosphere make this technique unusable. The joint Canadian-United States' North Warning System — presently being installed — provides an improved radar barrier to the north.

Other concepts — such as airships — are being examined to extend the warning perimeter even farther. In the final analysis, however, the military planners of both Canada and the United States believe that the key to air defense (or "aerospace" defense in our lexicon) in the future is space.

A space-based radar (SBR) system could allow the ability to track bomber a/c almost from the time they became airborne. An SBR — in conjunction with other systems — could eventually supplant the need to have interceptor crews visually identify the unknown; potentially hostile a/c could be identified as such if they originated from hostile territory. Interceptor control could become more effective and at the same time less reliant on airborne control a/c. More importantly, the combination of an SBR and "beyond visual range" engagement weapons would present challenges few archers could overcome. In the far future, it is not inconceivable that space-based systems could actually guide very long-range weapons directly to fixed or moving targets — including archers and arrows. These things, however, represent the future.

PRESENT

For the present, we must do the best with what we have. In practical terms, this means modernizing the equipment that we have — and the operational procedures and tactics that make our equipment effective — while, at the same time, taking an integrated approach toward planning for the future. Let me discuss modernization first.

Canada's acquisition of the CF-18 fighter has resulted in significant improvements in our ability to defend North America and preserve the air sovereignty of both our nations. The CF-18 is a great fighter. More importantly — and I speak with authority because I've flown with them — the CF-18 is flown by superb aircrew.

Canada's decision to prepare forward bases in the far north to accept these fighters will also contribute significantly to their effectiveness.

In the United States a commitment to modernizing the E-3A, Airborne Warning and Control Aircraft (AWACS), also represents a leap forward. A cost-effective Radar Sensitivity Improvement (RSI) to the E-3A will yield considerable operational advantages: more than a twofold increase in the size of the defended area a single a/c can keep under surveillance, more than double the ability to detect small radar cross section targets and cruise missiles, and a potential fivefold increase in the ability to engage hostile a/c. The advantages for North America are as clear as they are for NATO.

For modernization to be done efficiently and economically it is imperative that it proceed within a well-coordinated planning architecture. Hence, the Air Defense Initiative or "ADI."

Gen John L. Piotrowski, CinC NORAD and Capt Peter Lang, a pilot with 425 Sqn, after the general's familiarization visit to CFB Bagotville

The focus of ADI is the atmospheric threat to North America. Several areas are being examined, including the modernization and proliferation of ground-based radars, new and improved airborne surveillance platforms, and potential space-based surveillance systems.

The ADI, however, does not hinge on the success of revolutionary new technologies. Certainly some new technologies may be incorporated, but, for the most part, ADI is envisioned to be an affordable evolution of existing programs.

ADI's objective is to provide expanded coverage of the air approaches to North America and improved capability to detect, track and identify hostile air threats — anticipating that those threats will most certainly mature and diversify. Given fiscal realities and the versatile nature of the threat, this is a broad task, but one made easier by NORAD's 30-plus years of experience in air defense mission areas, along with an evolutionary approach to development rather than a revolutionary one.

DETER

Our objectives for the future are not complicated. We seek to deter always and to defend if necessary. Should it become necessary to defend our homelands, we must make the bombers run a gauntlet while simultaneously being prepared to respond to their every move. We must rely on our strengths. Foremost among these is the strength of the NORAD alliance and our force of air defenders. Machines extend the capabilities of human beings, but it is the human beings that a potential adversary should fear most. And that leads me to return to the third lesson learned at Crecy over 640 years ago.

Our free societies place a premium on human life. We concede to our adversaries the advantage of offensive initiative, while investing heavily in our ability to deter and defend. As a result, we have created an almost endless succession of technological innovations that give our defensive forces a potentially disproportionate lethality when weighed against their numbers. These innovations increase warning time, extend the defensive perimeter as far from the homelands as possible, will shortly enable engagements beyond visual range, and are responsive enough to anticipate shifts in a potential adversary's tactics and an improvement in his weapons. But even these innovations are not what a potential adversary fears most. What he must fear most is the reality that — if he ever makes a fatally flawed decision — he must oppose and penetrate a defended continent, two nations committed to fighting as one.

We are partners in the task of air defense and in the task of improving our air defenses. In the final analysis it is that partnership — that joint commitment and constant cooperation — that deters the archer and makes it prudent for him to keep his arrows quivered and on the ground. ⊛

Gen John L. Piotrowski (pronounced "PA-'TRAU-SKI") is currently commander in chief of the North American Aerospace Defense Command and the United States Space Command, both with headquarters at Peterson AFB, Colorado Springs. Born in Detroit, he enlisted in the air force in 1952 and received his commission and navigator wings in 1954 as a distinguished graduate of the aviation cadet program. In 1957 he graduated from pilot training.

He is a command pilot with more than 5,000 flying hours, including 100 combat missions and 210 combat flying hours. He has served in a variety of operational and key staff assignments throughout the United States and in South Korea, Japan, Germany, Italy, and Vietnam. His previous experience in command of operational units spans 12 years and ranges from wings with 4,000 personnel to 9th Air Force with over 38,000 members assigned. Prior to his present assignment, he was the vice chief of staff of the United States Air Force. He is married to the former Sheila Dee Frederickson and they have three children.

Air Force Times/November 14, 1988

Space commander aims at sky vs. space barrier

Gen. Piotrowski seeks to make AF needs known

By David Fulghum
Times staff writer

LOS ANGELES — The U.S. military is going to break down the barrier between the sky and space — operationally, if not physically — and become more aggressive in making its needs known, says Gen. John L. Piotrowski, commander in chief of U.S. Space Command and North American Aerospace Defense Command.

Piotrowski addressed an Air Force Association symposium on the future of the Air Force here Oct. 27 and 28.

He is unhappy that most space systems fail to meet operational requirements — such as providing replacements quickly for war-damaged satellites — that are demanded of equipment used by earthbound forces.

For example, the military's current ability to launch, sustain or use space equipment does not meet the readiness standards of a fighter wing, carrier battle group or armored division, Piotrowski said. While satellites have provided "timely and extremely fine-grain" information to U.S. commanders, it is not at all a given that they can be counted on in time of conflict, he said.

"I believe the current U.S. space systems are a fragile, thin blue line," he said. "(It is) a thin line that is not sufficiently backed up by on-orbit spares or a rapid replenishment capability."

However, an operational requirement is being put into such future systems as Navstar Global Positioning System, which will have spares already in space to replace satellites destroyed or rendered useless by enemy action, Piotrowski said.

While GPS project officials would not be specific about satellite defenses, they confirmed the general's statement about a system of spares. They also said new versions of the satellite will have an on-board system to help better defend against attack.

GPS is a constellation of satellites that eventually will number 24 on orbit at any time and that will provide extremely accurate navigational information to Air Force bombers and attack aircraft, project officials said.

Air Force officials will not confirm the scenario, but it is believed that in wartime the top-secret, soon-to-be-launched Keyhole KH-12 and other spy satellites would spot such mobile targets as Soviet rail- and truck-based ICBMs (SS-24s and SS-25s), and that this information would be transmitted quickly to roving B-2 Advanced Technology (Stealth) Bombers.

Officials did confirm that using GPS information allows precise calculations of tar-

"I believe the current U.S. space systems are a fragile, thin blue line. (It is) a thin line that is not sufficiently backed up by on-orbit spares or a rapid replenishment capability."

— Gen. John L. Piotrowski
U.S. Space Command chief

get and bomber locations. On-board equipment tells a bomber crew exactly where and how far to go to find its prey.

Holding up Navstar GPS as exemplar, Piotrowski said the war-fighting commanders "demand the same degree of readiness and sustainability for our (other) space forces," because these various satellite constellations provide them with communications, navigation and surveillance.

He said the military has improved its ability to get into space by moving away from exclusive reliance on the space shuttle.

"However, I'm not convinced that our near-term boosters — the Titan II, Delta II, Atlas II and Titan IV — are yet responsive enough to support the space requirements of the (Army) corps, the carrier battle broup or the wing commander in times of conflict," he said.

Piotrowski wants a stable of boosters

See SPACE page 69

SPACE from page 34

upon which he can put almost any payload and quickly get it into space. Currently, most payloads can be fitted only to specific boosters, he said.

The general also called for finding ways to increase launch support to combat commanders and the surveillance they have available. Key in the latter category is development of a space-based radar, possibly with an associated infrared (heat) sensor, he said.

"The technology is available for a radar based in space which could provide near real-time, all-weather global coverage for detecting fighter-sized aircraft and detecting and classifying ships," Piotrowski said.

Ships and aircraft could be located and tracked accurately to within a mile, Piotrowski said. Such a device in U.S. hands "would remove the horizon" for combat commanders, he said. It also would offset billions of dollars invested by the Soviets and others on offensive systems that could threaten U.S. forces, he said.

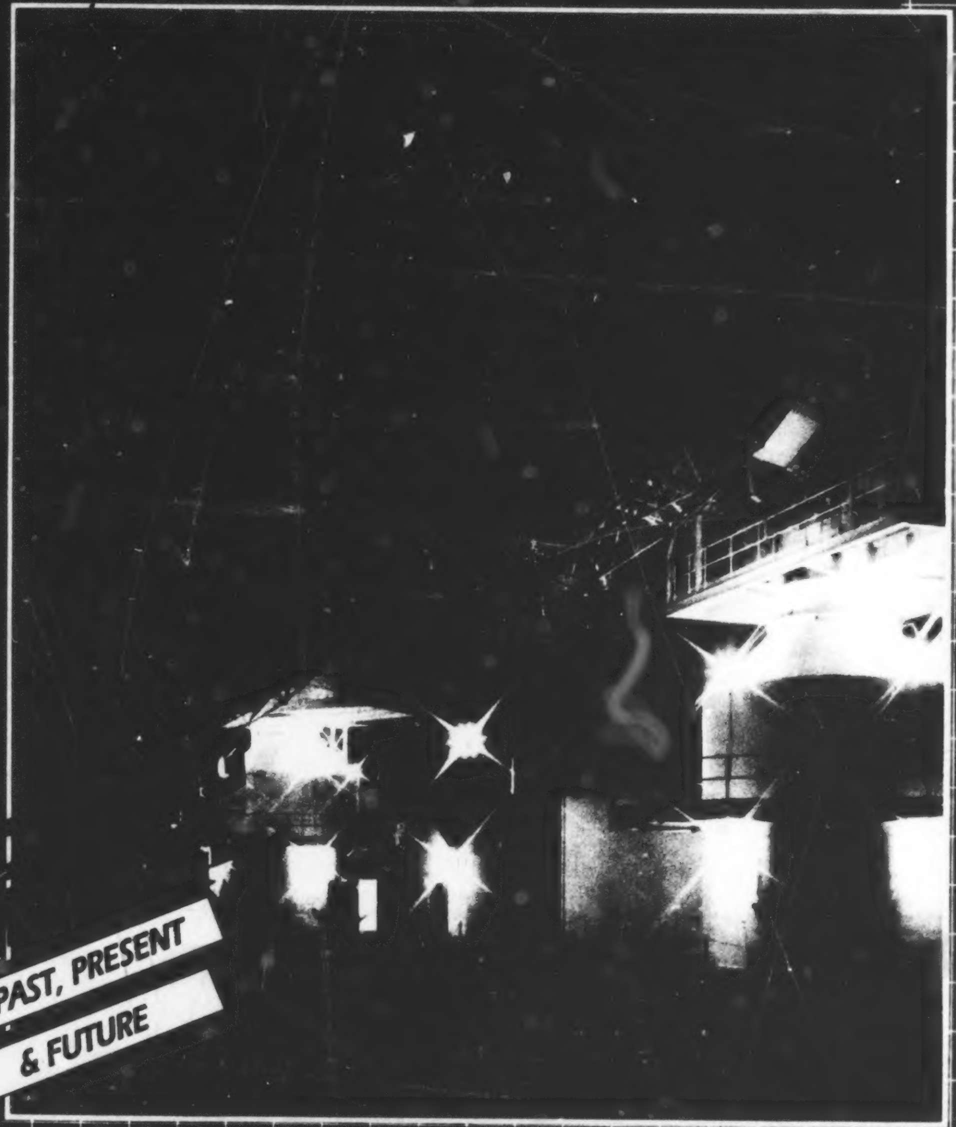
Moreover, in peacetime it would allow the U.S. military to more accurately keep track of its billions of dollars of military assets, he said.

Recently, Secretary of the Air Force Edward C. "Pete" Aldridge Jr. declared the service's role in space a major challenge. Aldridge charged Air Force officials with reviewing the concept, and among major conclusions the group returned was a declaration that "space power" will assume as decisive a role in future combat as air power does today, Aldridge said.

Moreover, the review stated, the future of the Air Force is inextricably tied to space, he said.

The review has not been released by the Air Force; however, Piotrowski said he has seen it and it essentially says the Air Force will "step up to the challenge."

The Air Force will make sure space power is properly represented at the higher levels of the Department of Defense and Joint Chiefs of Staff and in the budget, Piotrowski said. Air Force officials also will attempt to garner corporate agreement within the service on the importance of space, he said.



PAST, PRESENT & FUTURE

Space Operations Tomorrow:

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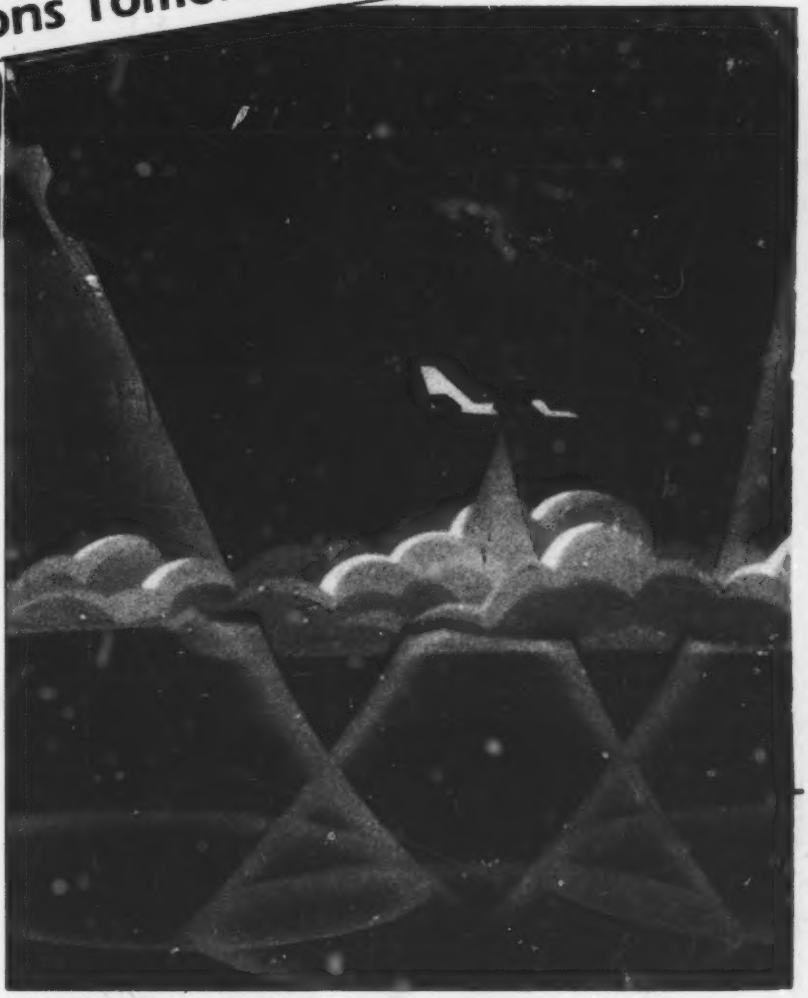
THE TA

By Gen. John L. Piotrowski, USAF
Commander in Chief, North American Aerospace Defense Command and United States Space Command

Tomorrow's space operations will benefit from a natural evolution that is occurring within our space community today. This evolution is subdued. Only those few people directly involved in overall plans, policy and operations of space systems are actually aware of the changes that are under way. It is a natural process of evolving space operations from a peacetime orientation to one stressing operational requirements that support tactical warfighting doctrine.

Evolutionary processes are often difficult to recognize. In the case of the one currently ongoing within space operations, there are some clear indicators; in particular, national and Department of Defense policy statements and the creation of operational commands. "Our National Space Policy," issued in January 1988 by President Ronald Reagan, illustrates this process by reconfirming the vital role that space systems perform in achieving our overall national security objectives. The Army Space Command's formation in April 1988 also continues this process by providing the relatively new United States Space Command (established September 1985) with its third, and final, component command–each responsible for providing modern, ready and sustainable forces to carry out



An artist's drawing showing a space-based radar system. Such a system would provide the United States with the surveillance needed to support worldwide tactical operations.

> These operations will be characterized by support to our forces that is more timely, more simple, more flexible, more direct and readily available when needed most.

the missions of the United States Space Command.

Tomorrow's Requirement

From an operational viewpoint, tomorrow's most pressing requirement is to make space systems more available and "user friendly" to battlefield commanders. Our military forces, especially those deployed in overseas theaters, use space systems to perform their day-to-day and potential wartime missions, and demand for information originating in space continues to grow.

Nevertheless, many commanders are not aware of how extensively they rely on space systems for support. Support from space systems is often "transparent" to a commander, even though surveillance, comunications and navigation information derived from space systems is vital to his mission. Such combat support from space systems provides the tactical advantage needed for success on the modern battlefield.

Many commanders also believe that space systems cannot be depended on in wartime and thus have little warfighting value. This lack of confidence is generated by problems associated with access priority to multi-user platforms; special security requirement constraints placed on information; and the relative fragility and vulnerability of many of our current space systems. With such perceptions, it is no wonder the value of today's space systems is not more universally recognized by battlefield commanders. Strategic war games and exercises continue to highlight an overall lack of awareness with regard to how space systems can improve combat effectiveness and save lives on the battlefield. These perceptions must be, and are being, reversed as commanders learn more about ongoing efforts to make access to space systems more user friendly, reliable and timely–in peace and throughout the spectrum of conflict.

Tomorrow's space operations will be pervasive in combat. While today's operations provide our commanders extensive support, tomorrow's will provide even more. Commanders will depend on space as they now depend on strategic and tactical airlift, resupply by maritime forces, field artillery support and the like. They have every right to expect this. Space operations tomorrow will be characterized by surveillance, communications and navigation support to our tactical forces that is more timely, more simple, more flexible, more direct and readily available when they need it most. In this regard, the United States Space Command is in the business of supporting warfighters.

Surveillance

Our intelligence systems must do a better job providing tactically significant intelligence on Soviet space activity and informing commanders concerned. It must become commonplace for commanders to easily ask for and receive timely answers to questions such as: When will ports and transiting convoys come under Soviet satellite coverage? How many Soviet reconnaissance satellites are on orbit? Is there any unusual or threatening Soviet space activity in orbit? Have Soviet communications satellites increased in number? Where is the Soviet space station Mir in relation to planned operations? Have friendly satellites been destroyed or suffered any degradation?

Ballistic Missile Warning. While the current missile warning system is virtually failproof in providing the United States tactical warning against any ICBM or submarine-launched ballistic missile attack, improvements can be made to better support tactical operations. Currently, space-based early warning satellites would provide the first warning of strategic attack on the United States or our allies by detecting either land- or sea-based ballistic missile launches early in flight. The Ballistic Missile Early Warning System radars located at Fylingdales Moor, United Kingdom; Thule Air Base, Greenland; and Clear Air Force Station, Alaska; and phased-array radars located at Cape Cod Air Force Station, Mass.; Beale Air Force Base, Calif.; Cavalier Air Force Station, S.D.; Robins Air Force Base, Ga.; and Eldorado Air Force Station, Texas, would then detect and track the threatening missiles.

Data from each of these sophisticated and reliable sensors is transmitted to, and processed by, personnel located at Cheyenne Mountain, Colo. Therefore, the combination of space-based systems using infrared sensors and ground-based radars provides a "dual phenomenology" for detecting and tracking ballistic missile launches necessary to provide the National Command Authorities and other users with prompt and reliable warning information.

While today's network of satellites and ground-based radars certainly performs its intended ballistic missile warning mission, tomorrow's operational requirements must expand this mission to be more responsive to tactical operations. The direction taken in the development of a new Boost Surveillance and Tracking System is encouraging in great part because we have realized the need for sustainability and the readiness benefits derived from providing direct downlink information from on-orbit missile warning assets to our tactical commanders.

A near-real-time capability to track and assess submarine-launched ballistic missile and tactical ballistic missile launches against deployed forces will prove invaluable to tactical commanders both on the ground and on the seas. Perhaps more importantly, such a capability will provide commanders with a tangible link to operational space assets, thus increasing their overall confidence in support from space systems.

There's more. Future operations require a larger on-orbit missile warning force structure to provide more survivable global coverage and "surveillance in depth." Such a force would be able to focus on world hot spots to better support tactical operations without affecting our nation's vital global strategic surveillance.

Weather. Our environmental surveillance satellites also do a remarkable job providing weather and environmental support to our tactical commanders. Still, more could be done. While our Defense Meteorological Satellite Program provides the capability to collect and disseminate global data to support worldwide and high-priority operations, the current two-bird constellation is not capable of providing tactical commanders timely or complete information.

While ground, sea and air forces may have a good picture of the weather in their local areas of operation, they may not have a good picture of what's in front of them or on their flanks. If future space operations are to provide adequate weather support to our tactical commanders, a larger Defense Meteorological Satellite Program-type constellation is required. In addition to facilitating a more direct tasking capability for our ground, sea and air commanders to support their tactical requirements, an enlarged constellation would ensure more complete and timely readouts of local weather patterns for tactical operations worldwide without degrading overall strategic weather surveillance.

Space-Based Radar. The addition of a space-based radar would provide our warfighters with the surveillance needed to support worldwide tactical operations. As presently envisioned, a space-based radar constellation would provide continuous global, near-real-time, all-weather coverage. It would be able to detect and track fighter-sized aircraft and detect and classify ships at sea. While strategic defense operations would benefit greatly by detecting atmospheric threats from space (in order to capitalize on the disadvantages the Soviets bear because of their geographic location), the space-based radar must be developed also with a tactical focus.

The ability to continuously and accurately track atmospheric threats from their points of origin would have an incredible impact on tommorrow's tactical operations. By helping to dissipate the fog of war, space-based radar would allow commanders to employ their forces at the right place, at the right time and in the right mix. Most importantly, space-based radar must provide its information directly to tactical commanders, thereby eliminating delays inherent when intermediate ground stations process and relay information.

Communications

The effective employment of tactical forces demands instantaneous, secure and clear communications. While our existing Defense Satellite Communications System and Air Force Satellite Communications System provide communications service between the National Command Authorities and the unified and specified commands, future operations will be improved with the deployment of Milstar, the next-generation communications satellite. Milstar will provide jam-resistant, survivable, secure communications through all levels of conflict. It will provide air, ground and sea forces as well as the National Command Authorities with assured communications to support the execution of both strategic and tactical missions.

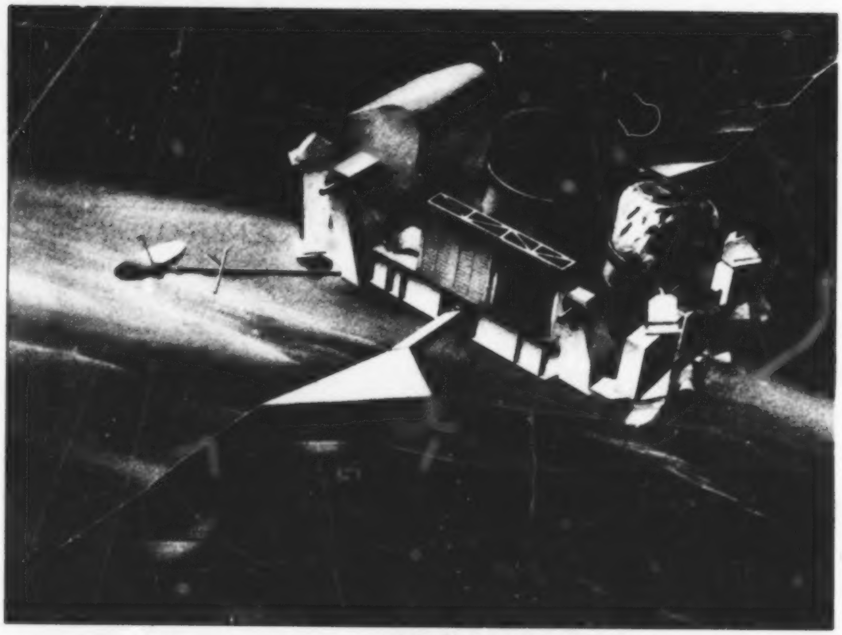
Milstar's use of extremely high-frequency and other advanced communications techniques will enable the system to function effectively in nuclear and radio-electronic combat environments, while still greatly reducing the probability of signal interception. Satellite crosslinks will provide global connectivity without dependence on vulnerable ground-relay nodes, and sophisticated encryption techniques will provide communications security.

Additionally, a distributed ground control system will support Milstar's survivability across the conflict spectrum. These attributes will provide a degree of survivability, security and endurance not present in existing communications systems. The operational benefits of such a system to tactical users is obvious. Tomorrow, communications support for space will be available to the tactical forces when they need it most.

Navigation

Space operations in the navigation arena are currently provided by the United States Space Command's Transit system. It is operated by the Naval Space Command primarily in support of important strategic operations. Navigation is about to be revolutionized in a manner that will provide a true tactical advantage to our land, sea and air forces. The impending deployment of the operational NAVSTAR Global Positioning System will ensure synchronized timing and the use of a common positional reference accurate to 16 meters or less. Tactical applications will include pinpointing troop assembly points and objectives, coordinating artillery and air strikes, station keeping at sea and in space, coordinating search and rescue operations, enhancing electronic countermeasures and ensuring accurate all-weather resupply operations, to name just a few.

Clearly, the Global Positioning System will make smart weapons smarter and enable the type of precisely timed and coordinated maneuvers that can wreak havoc on less capable enemy forces. Because it provides such tremendous tactical capabilities, Belgium, Canada, Denmark, the Federal Republic of Germany, France, Italy, the Netherlands, Norway, Spain and the United Kingdom will join the United States in incorporating NAVSTAR into their military force structures. Today, every major commercial and military ship at sea has a Transit receiver. Tomorrow, precision location data from space will be available to explorers, truck drivers, pilots, platoon leaders, tank crews and others virtually without limit.



The NAVSTAR Global Positioning System will allow users to place themselves within 16 meters of their location. The 18-satellite constellation's military applications include weapons delivery, rendezvous, precision mapping and point-to-point navigation.

Space Control

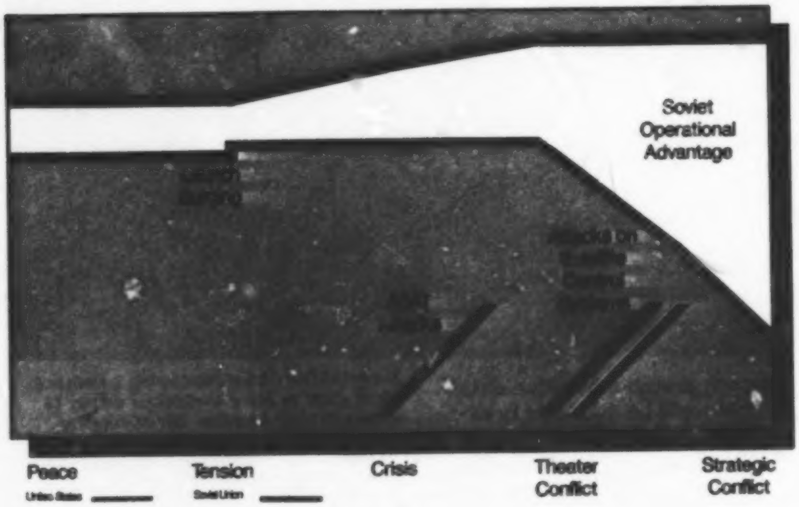
In addition to enhanced surveillance, communications and navigation support to tactical operations, assured space operations require a space-control capability. This is imperative to enhance the survivability of our military space systems through deterrence and, if required, to degrade overall Soviet military capabilities.

Space control must become an integral part of tactical operations. At sea, battle group commanders could require that Soviet intelligence-gathering spacecraft be degraded or destroyed. Lacking the capability to nullify Soviet combat-support space systems such as their radar ocean reconnaissance and electronic ocean reconnaissance satellites and their ability to locate, identify and target U.S. and allied forces at sea, we abdicate a staggering advantage to the Soviets. On the ground, U.S. and allied commanders could require that Soviet reconnaissance satellites be prevented from "telegraphing" friendly operations to enemy headquarters. Also, operational commanders should be aware of Soviet men in space. The Mir space station–a constantly manned observation platform–cannot be overlooked as a potential military asset.

The operational impact caused by losing satellites that support U.S. and allied strategic and tactical operations must be considered in war planning. Space control capabilities would allow us to defend, to a large degree, our own spacecraft through use of defensive countermeasures against Soviet attack, as well as negate an enemy's space order of battle through employment of anti-satellite capabilities. Currently, these U.S. providers of vital communications, navigation and surveillance data are exposed and without defense to a formidable family of Soviet anti-satellite capabilities. This includes an operational co-orbital system, a direct ascent anti-ballistic missile system with anti-satellite capabilities and several directed-energy anti-satellite-capable systems, which can disrupt, degrade or destroy critical spacecraft. To leave U.S. and allied space systems hostage to Soviet philanthropy is untenable because it significantly increases the risk to the warfighters who depend on these systems to conduct tactical operations on the land, at sea and in the air.

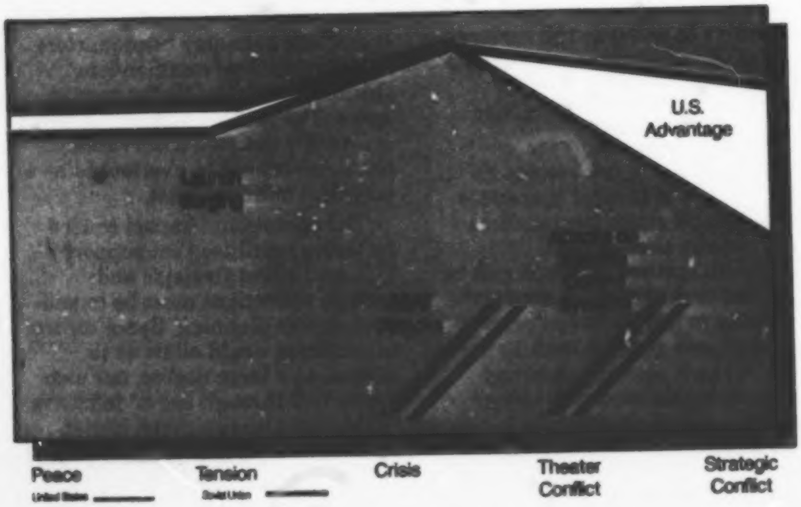
CURRENTLY PLAUSIBLE SCENARIO

Space Order of Battle



PREFERRED SCENARIO

Space Order of Battle



Planners and operators must concentrate on identifying the requirements for developing the military space capability needed to ensure that the currently plausible scenario (see chart) is made invalid and that an alternate scenario becomes the expected. If we went to war today, the space battle for tactical support to terrestrial forces would be in the Soviets' favor. As shown in the first scenario, the Soviets' larger space order of battle, far greater launch surge capabilities and robust anti-satellite capability result in an ever-increasing Soviet operational advantage. Naturally, the preferred scenario has many implications for future U.S. space operations–more satellite force structure and spares on orbit, more war reserve satellites and boosters available on the ground, a launch infrastructure able to surge and a space control capability to protect our space order of battle and negate hostile space-based assets.

Tomorrow's Space Operations

Future military space operations must be treated with the same "developed-for-war" approach that today is applied to operations on the land, sea and in the air. We would not send resupply ships to sea without first establishing sufficient control of the sea to be reasonably assured of safe passage. Likewise, ground commanders require a measure of control of the airspace over the battlefield. In each, lessons learned in war show the need to control the sea and air.

Although we have no wartime experiences involving such a complete dependence on space or conflict in space, I believe the same basic principles will be applied in tomorrow's space operations. The bottom line is clear: The evolution of space operations away from a solely peacetime orientation to one stressing warfighting requirements must continue–in order to deter aggression and, if deterrence fails, succeed on the battlefield.

Let me offer my view of the future and what I expect to become operational reality. The proper vision of tomorrow's defense-related space operations is one in which warfighting criteria, military doctrine and an operations mind-set are applied to the development and operation of space systems. The demands for space operations tomorrow are similar to those of other military forces. The need for readiness, sustainability, force structure and modernization applies to space systems as well as air, land and sea forces.

Readiness improvements to space systems are those that provide our combat forces the means to increase their posture and prosecute conflict immediately upon direction. Onboard satellite processing of data and direct downlinks to the tactical user will be commonplace tomorrow. Satellite-to-satellite crosslinks and more direct tasking of satellite support by the tactical commanders will be accomplished. Normalized launch operations for both peace and war and operationally ready standards to satellite launch systems will occur.

Sustainability in space operations allows continued support to combat forces by space systems throughout the duration of battle while accepting inevitable wartime losses. Survivability techniques that include passive and active defensive countermeasures will be built into our satellites to mitigate anti-satellite, laser and electronic-warfare attacks.

On-orbit spares must be prepositioned with every military satellite constellation to reconstitute wartime losses when defenses are penetrated. Additional spare satellites stored on the ground with spare boosters as war reserve materials should be available for launch to increase wartime support as the situation dictates or to replenish wartime losses. Our launch infrastructure should include the capability to "surge" with rapid pad turnaround times. We must have a fully operational and very capable anti-satellite system to deter aggression and to deny the enemy support from their satellite systems.

Force structure improvements will probably include more satellites in our current constellation and new satellite systems, especially a space-based radar, which emphasize operational support to tactical users. War reserve satellites and boosters would provide an inventory of "demand support" during crisis or war. More launch pads should be made available to support a wartime surge of launches, and an anti-satellite system will be at the ready to contest the Soviets' space order of battle.

Modernization improvements will provide surveillance systems with more sensitive sensors, a broader sensing spectrum and survivability features. Communications satellites will have higher frequencies, more channels, more bandwidth and defensive countermeasures. The NAVSTAR Global Positioning System will provide three-dimensional, instantaneous, totally global geopositioning for our warfighters–strategic and tactical.

These four pillars of military capability–readiness, sustainability, force structure and modernization–must be applied rigorously to the development of tomorrow's space systems. Only when this is done–and I believe it can be done–will our warfighters on the land, at sea and in the air receive the tactical advantage from space that they deserve. ■

**General
John L. Piotrowski, USAF**

Born in Detroit, Gen. Piotrowski enlisted in the Air Force in 1952, received his commission and navigator wings in 1954 and completed pilot training in 1957. Prior to his present position, Gen. Piotrowski served as the U.S. Air Force vice chief of staff. Other key assignments include: commander, 9th Air Force; deputy chief of staff for operations, Tactical Air Command; and deputy commander for air defense, Tactical Air Command. A graduate of the University of Nebraska at Omaha, he did postgraduate work at the University of Southern California and Auburn (Ala.) University and attended Harvard's Program for Management Development. He also holds an honorary PhD from Alliance College, Pa.

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Soviet Space Doctrine for Warfighting

By Gen. John L. Piotrowski, USAF

The leadership of the Soviet Union recently announced a major alteration of Soviet warfighting doctrine—a shift from the inherently offensive strategy to an implied defensive strategy of *razumnaya dostatochnost*, or reasonable sufficiency.

However, convincing evidence of this shift has yet to be seen in Soviet force structure, training or operations. In fact, Soviet defense spending has risen, and modernization and growth in strategic forces have increased. Until meaningful changes occur in the Soviet Union's socioeconomic status, its superpower status and its ability to achieve strategic objectives are still derived solely from military power. Lacking observable changes and facing an imbalance in military space capabilities that favors the Soviets, the United States must continue to examine some of the key features of Soviet warfighting doctrine in an attempt to determine the ways in which such features might apply to Soviet space forces and their operational employment in wartime.

Background

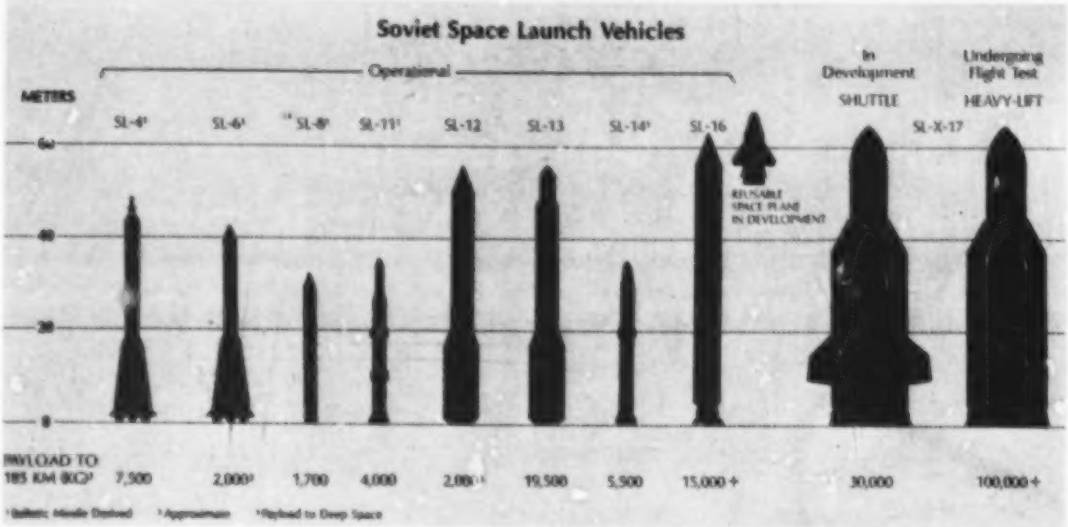
To begin, here are three thoughts as background. First, for more than 60 years, Soviet military thinking has been circumscribed and channeled by the tenets of Marxism-Leninism. Marxism-Leninism takes a rigid and deterministic view of history and offers a rather large set of principles that seeks to describe and ultimately govern human activities. These principles are apparent in virtually all Soviet endeavors. Soviet behavior, then, is both motivated and purposeful: motivated by a desire to realize the vision of Lenin and purposeful to the degree that Soviet society marches toward realization of the world view that Lenin espoused.

Second, Soviet military art—defined as "the theory and practice of engaging in combat operations and armed conflict as a whole"—is the principal field of Soviet military science. As such, it includes doctrine, strategy and tactics, all of which the Soviets believe "constitute an organic, interdependent unity." As in every other area of Soviet society, military science and military art are governed by the deterministic laws of history that Marx and Lenin described. An understanding of these laws allows not only understanding of the Soviet character, it also allows an understanding of how the Soviets plan to fight.

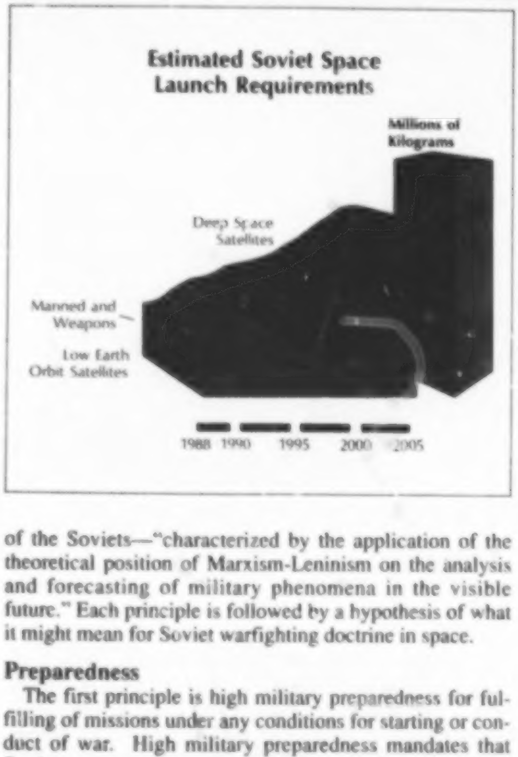
Third, and finally, Soviet political and military leaders are a calculating group. By virtue of their educational system, Soviet citizens are well educated in mathematics, and Soviet military leaders have had extensive exposure to operations research and operational analysis. Soviet captains can compute the correlation of forces for their segment of the battlefield, and they understand the various ways in which they can use available resources to shift that correlation more or even totally in their favor. Western military forces began to embrace a unified theory of combat in the early 1980s, while such theories have been taught in the Soviet Union since the 1930s.

Principles

The following 10 principles are contained in the Soviet Military Encyclopedia and are—in the words



Soviet Space Launch Vehicles



Estimated Soviet Space Launch Requirements

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of the Soviets—"characterized by the application of the theoretical position of Marxism-Leninism on the analysis and forecasting of military phenomena in the visible future." Each principle is followed by a hypothesis of what it might mean for Soviet warfighting doctrine in space.

Preparedness

The first principle is high military preparedness for fulfilling of missions under any conditions for starting or conduct of war. High military preparedness mandates that Soviet space systems be responsive to the operational requirements of Soviet strategic objectives. Accordingly, the Soviet launch infrastructure is the most responsive in the world. The Soviets conduct approximately 100 space launches annually from their three multipad cosmodromes, approximately five times more than all Western nations combined. Similarly, the large Soviet on-orbit spacecraft force structure is designed to give them decisive advantages over Western forces during a conflict. The Soviet space force, like other elements of Soviet forces, is designed to prevent surprise, but, even if surprised, the on-orbit force structure is adequate until space reinforcements arrive. The long-term Soviet commitment to space preparedness was reaffirmed by General Secretary Mikhail Gorbachev in May 1987 at the Tyuratam (Baikonur) Space Center, prior to the first test launch of the new heavy lift SL-X-17 space booster. He stated, "We do not intend to relax our efforts and lose our vanguard position in the conquest of space."

Initiative

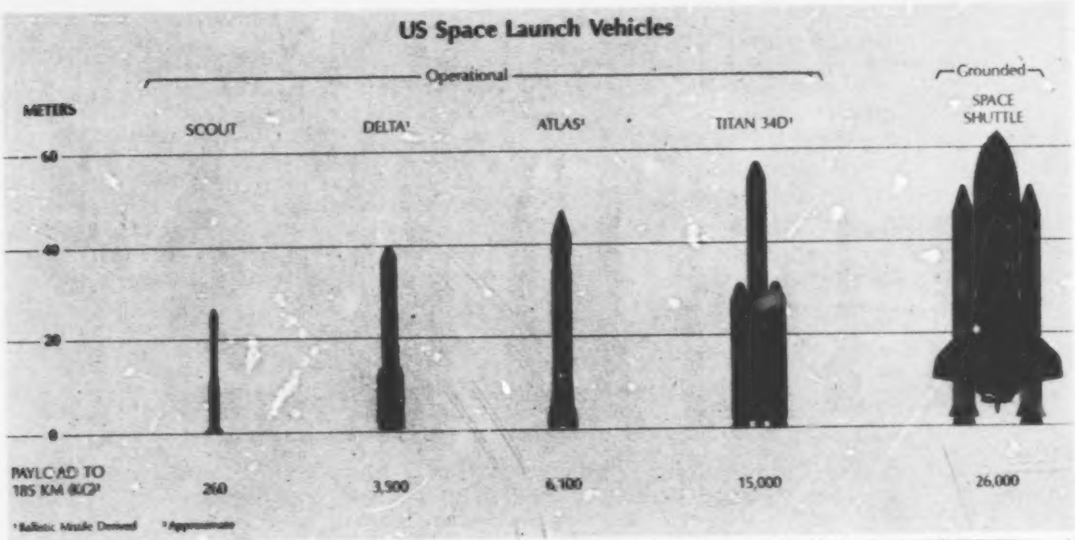
Using surprise, decisiveness and aggressiveness of military activity, the Soviets continually strive to achieve and retain the initiative.

Soviet military operations are initiative oriented, and the commander must be able to take the initiative and secure the objective within the critical time. Responsive launch operations, an abundance of maneuverable spacecraft and antisatellite systems combine to provide the opportunity to seize the initiative and shift the correlation of forces in the Soviet Union's favor. Soviet co-orbital antisatellite interceptors as well as other antisatellite-capable weapons (direct ascent missiles, high energy lasers and radio-electronic combat systems) can all be employed with little to no warning and could allow the Soviets to control space by disrupting, degrading or destroying Western space assets at times and places of their choosing.

Disproportionate Forces

The Soviet Union will make full use of the various means and capabilities of battle to achieve victory. The expectation that Soviet space forces will engage in limited attacks on U.S. space forces is a false hope. History records that it was the Soviets who bombarded Berlin with seven million artillery shells before the first Soviet soldier entered the city. While Western analysts eschew the use of disproportionate forces, the Soviets believe its application is the essence of the correlation of force formula. A comparison of the current conventional balance of forces between NATO and the Warsaw Pact highlights this fact.

Additionally, the Soviets will not be deterred from using antisatellite weapons in a crisis, and the use of these weapons will not be in any way moderate unless there is a United States-Soviet balance in antisatellite capability. Ample evidence exists that the Soviet warfighting appa-



US Space Launch Vehicles

¹Ballistic Missile Derived ²Approximate

ratus is prepared to conduct an initial and decisive assault—on the ground, in the air and in space.

Coordination

The Soviet Union coordinates application of and close cooperation between major units of all the armed forces and branches of service. Ninety-five percent of Soviet space systems have military application, and they are designed to support other Soviet offensive and defensive forces. To the degree possible, all Soviet military operations will be closely controlled and well-coordinated to achieve the objectives of the "front." Soviet space operations, even if they occur in a separate strategic zone, will always be directed toward meeting the objectives of the principal front commander. Thus, Soviet space control activities will occur simultaneously with Soviet force-enhancing launch operations. The Soviets have the capability to undertake and sustain both space control and force-enhancement operations.

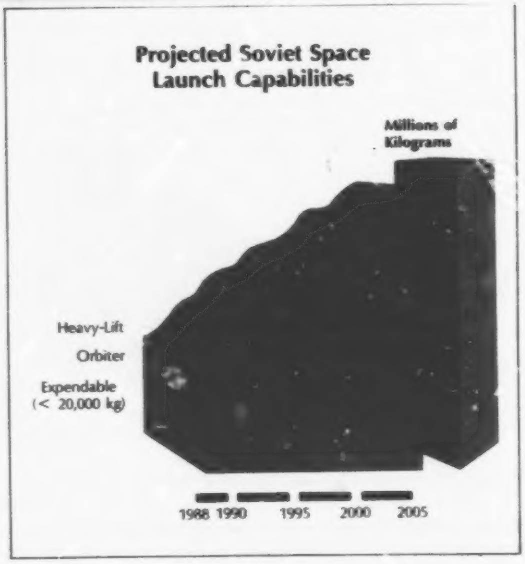
In late 1984, a new Soviet auxiliary ship was seen arrayed with extensive radomes and antennas. This ship, named after the first commander of the Strategic Rocket Forces, Marshal M. I. Nedelin, appears to be a new space and missile support ship able to perform a variety of missions, including support to strategic forces worldwide. The *Nedelin* joins a growing fleet of Soviet space support ships that provide assistance to manned and unmanned space missions.

Additionally, the Soviets operate several types of space-based reconnaissance systems. Two of these, the RORSAT and EORSAT, are used to locate naval forces that could be targets for destruction by antiship weapons. Moreover, the Soviets actively practice the integration of these space and naval forces, and they routinely launch these satellites to monitor both Soviet and NATO exercises.

Concentration of Forces

The Soviets apply decisive concentration of the essential force at the needed moment and in the most important directions and for the decision of the main mission.

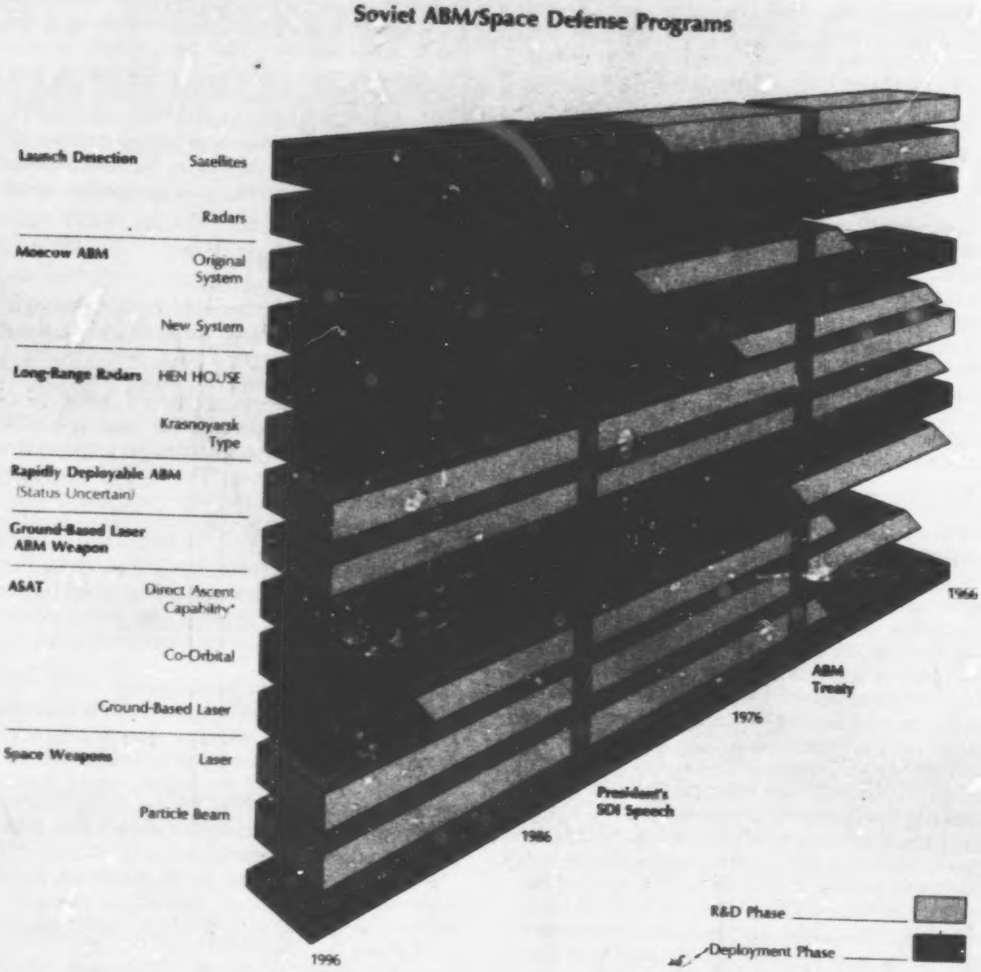
Although some might construe this as merely being a Soviet restatement of the accepted principle of mass, it is actually more than that. The crucial factor of rapid responsiveness of space forces not only includes the Soviet capability to conduct surge operations in time of crisis, but it also includes the capability to maneuver spacecraft already in orbit to concentrate coverage over specific terrestrial areas. During the Falkland Islands conflict in 1982, the Soviets conducted 28 space launches in just 69 days. That impressive demonstration of Soviet space power occurred at a time when no discernible Soviet vital interest was at stake. The advantage of such actions is that they are essentially nonthreatening and nonescalatory means of improving capabilities. Since that time, the Soviets have continued to increase the size of their space order of battle.



Projected Soviet Space Launch Capabilities

SOVIET MILITARY POWER 1988

Although there certainly must be some physical limit to the Soviets' capacity to launch and sustain space forces, they apparently have not yet approached it. The advantage a large on-orbit force of operational and standby spacecraft could give them in a crisis is disturbing. In fact, if the entire Soviet satellite force structure were destroyed, it appears they could totally reconstitute it in a matter of months. The West has no wartime space surge capability.



Soviet programs for ABM and Space Defense, which include advanced technologies and space-based weapons, were in place prior to the 1972 ABM Treaty and have continued to expand in scope and size. During the same time period, US ABM/Space Defense research has been limited in scope as well as level of effort in terms of resources invested.

*Potential capability of the Moscow ABM system

Destruction of the Enemy

The simultaneous destruction of the enemy to the entire depth of its deployment, the timely accumulation of forces, the clever maneuver of forces and means for the development of military action at a rapid tempo and the destruction of the enemy in a short period, as they apply to space, have failed to draw the recognition they deserve. Modern military operations rely on space forces for communications, aids to navigation, environmental data and surveillance and warning information. Terrestrial forces denied these kinds of support are, or would be, at a considerable disadvantage, especially in the face of forces fully enhanced by such support. Although some will argue that the Soviets are less dependent on space based capabilities than the United States and its allies, application of the principle for centralized control of strategic forces and even for troop control at the operational level dictates that Soviet space dependence will increase.

Accordingly, force enhancement would be accomplished by launching the appropriate kind of spacecraft at the appropriate rate and time. Denial or negation would be attained by degrading, disrupting or destructing of U.S. and allied spacecraft launch facilities and the many and dispersed ground supporting systems. The latter includes satellite control stations, receiving sites, data distribution and relay nodes for space derived information and space surveillance sensor sites. Because the ground supporting centers of the United States and its allies comprise a global network, it is likely that any conflict could also envelop some of these elements.

Propaganda

As part of its propaganda efforts, the Soviet Union calculates and fully exploits the moral-political factor. The West historically has taken the view that conflict is an aberration. The Soviets, on the other hand, accept conflict between communism and imperialism as the status quo. Military operations are, therefore, simply an expression of a conflict that always exists. Thus, and in spite of their rhetoric, the Soviets see the United States as an adversary even in peacetime.

The Soviets clearly have exploited the moral-political factor in space. Since the 1950s they have repeatedly accused the United States of militarizing space. They, on the other hand, assert that their sole objective in space is and has been the peaceful exploration of the cosmos. In fact, the Soviets claim to have no military space program at all. Ironically, when Tass announces the launch of a Soviet spacecraft that the United States has determined to be a photographic reconnaissance satellite, Soviet citizens are told that the launch was "a scientific payload" that "contained radio-telemetry apparatus for the measurement of various parameters" and in pursuit of "the peaceful exploration of the cosmos." The Soviets, then, have not only calculated the moral-political factor, but also are exploiting it successfully.

The Soviet self-imposed antisatellite testing moratorium is a brilliantly executed example of Soviet exploitation of the moral-political factor. After conducting a score of test and certification launches of their co-orbital satellite interceptor, the Soviets had confidence in the operational effectiveness of their system. Seeing the U.S. antisatellite system and the Strategic Defense Initiative (SDI) program moving forward, the Soviets astutely declared that they would refrain from further testing of their antisatellite system as long as the United States refrained from stationing offensive weapons in space.

Although full and visible Soviet testing has not occurred, conclusive evidence shows that the Soviets have maintained an operational system through routine testing of antisatellite components and procedures. Yet, the impression created by exploiting the moral-political factor was that Soviet behavior is good, and U.S. behavior is bad. The same kind of misinformation is occurring in the Soviet response to the SDI research program envisioned to defend against ballistic missiles—research that has been under way in the Soviet Union for more than 20 years.

Strict and Uninterrupted Leadership

Since its beginning, the Soviet space program has demonstrated a steadfast continuity of direction. The Soviets have calculated the requirements that space can fulfill and tenaciously set out to meet those requirements. The United States, on the other hand, has redirected its space goals with each new Administration. As a consequence, the United States seems to continue to zigzag ineffectively toward periodically changing space goals.

The development of Soviet launch capabilities clearly demonstrates the Soviet Union's steadfastness of purpose and continuity of leadership philosophy. Since 1957, its launch and lift capabilities have increased by relatively stable increments each year. This upward trend in number of launches and lift capability shows a long-term dedication not present in the United States. Soviet leaders simply view space as a regime that can and must support these long-range strategic goals.

Comprehensive Security of Combat Activity

The Soviets are experts at maintaining secrecy. While they know many key features of many militarily significant U.S. and allied satellites, the United States has large gaps in its understanding of Soviet space forces. Because of the mesmerizing effect of the closed Soviet society, the United States only sees what the Soviets want it to see. For example, even this article is speculative, precisely because the United States does not know the details of Soviet space warfighting doctrine. Nevertheless, I firmly believe that Soviet space warfighting doctrine reflects overall Soviet military doctrine as the Soviets continue to ensure that the correlation of forces in space remains in their favor.

Reserve Restoration and Combat Force Capability

Although the United States lacks an operational antisatellite system, Soviet space forces clearly are designed to be consumables in warfare. Some people belittle Soviet spacecraft designs because the designs result in systems that are far less sophisticated than those of the United States. Nonetheless, these simple systems can be produced rapidly, launched quickly and put into operation in a very short period of time. The decided advantages this provides in wartime are only now being realized.

While emerging technologies may require modifications to tactics, these 10 doctrinal principles likely will remain unchanged. Applying them to Soviet space forces and space operations is both prudent and instructive. A remarkable fidelity exists between Soviet doctrine, Soviet behavior and Soviet weapons acquisition and employment practices.

Implications for the United States

The Soviets have methodically and conscientiously worked to ensure that their space forces serve Soviet national and military leadership in a crisis or conflict. Because U.S. space forces are held at risk by Soviet antisatellite weapons, assured operations during conflict are a vision that will remain unfulfilled in the United States until it acts to redress this imbalance.

Second, in space as on Earth, the Soviet Union undoubtedly will continue to apply efforts primarily in the military arena. Should deterrence ever fail, Soviet warfighting principles will apply in space just as they apply wherever Soviet forces are engaged. U.S. space forces could be attacked and would not serve U.S. operational commanders in all of the ways in which they could or should.

Conclusion

It is important to remember that Soviet space warfighting doctrine is an integral component of overall military doctrine. Soviet doctrine does not view space as a separate theater of military operations but as an extension of the terrestrial environment. Most importantly, until the United States sees a true shift in the Soviet force structure, including the Soviet space force and the operational reality of Soviet forces, the new Soviet leadership's assertion that its overall military doctrine has shifted should be viewed with extreme skepticism.

• • • — • —

Gen. John L. Piotrowski, USAF, is Commander in Chief, North American Aerospace Defense Command and United States Space Command, and a member of the AFCEA Rocky Mountain Chapter.

Space

Gen. Piotrowski: Soviets have superior operational strength

By Tom Joyce

American Forces Information Service

"Today I would submit that the Soviet Union — despite what we might call technological deficiencies — has developed a superior operational strength in space [to that of the United States]," Gen. John L. Piotrowski, commander in chief, North American Aerospace Defense Command and U.S. Space Command, said recently.

That strength, he said, is built on three pivotal characteristics:

■ Force structure. This includes eight launch vehicles, with a ninth in development.

"One of their boosters, the SL-04, alone has launched more times than the total number of successful U.S. space launches," said General Piotrowski.

■ Readiness. The Soviets have more than 150 satellites with predominantly military missions on orbit to support their terrestrial forces.

■ Sustainability. "These satellite constellations are sustainable," said General Piotrowski. "During the Falklands war, for example, they launched 28 times in 69 days — a capability only dreamed of in this country."

The general said there are other considerations when determining leadership in space.

"Quality, for instance," he said. "When all things are considered, the U.S. is clearly the peacetime leader in space."

His mission, however, General Piotrowski said, is not coordinating peacetime requirements but rather meeting wartime military requirements.

"I'm not convinced that peacetime leadership necessarily equates to assured mission capability in wartime," he said.

The general then spoke of two Soviet capabilities that he sees as most worrisome and threatening to military forces: tactical targeting and anti-satellite systems.

Soviet targeting spacecraft, he said, "provide real-time targeting data directly to selected deployed forces." He said using space-derived targeting data, "Soviet anti-ship weapons could accurately engage U.S. forces at sea."

With regard to anti-satellite systems, General Piotrowski said the Soviets possess the world's only operational one.

"Their co-orbital anti-satellite is capable of attacking all U.S. and allied low-earth-orbiting satellites," he said.

U.S. satellites, then, will be available in crisis or war only if the Soviets elect not to use their anti-satellite capability.

"I believe the Soviets are incapable of such strategic philanthrophy," General Piotrowski said. "Their doctrine says they will employ anti-satellites against opposing satellites, and their systems give them the capability.

"Our reliance on space for the functions of communications, navigation and surveillance creates an incentive for Soviet anti-satellite employment. Yet, we lack the capability to defend our spacecraft, to replace lost spacecraft or to remove the advantage an opposing commander would obtain from his spacecraft. In short, the existing U.S. space force structure lacks a space control capability."

General Piotrowski called for the United States to develop strategies and capabilities to ensure access to space lines of communications throughout all levels of conflict. He suggested a strategy based on offense and defense.

"Perhaps a passive defense for some satellites — those in geosynchronous orbit — an active defense for others — those threatened by the Soviet co-orbital and direct ascent anti-satellite systems — and a robust U.S. anti-satellite capability," the general said.

General Piotrowski also supported the fielding of a space-based surveillance system than can detect and track enemy forces from point of origin, in all weather conditions.

"U.S. military forces are, without question, linked to space," he said. "Space cannot be separated from our national security. There are many challenges, but space power will become as critical to future military operations as air or sea power is today."

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

UNITED STATES SPACE COMMAND
PETERSON AIR FORCE BASE, COLORADO 80914-5003

OFFICE OF THE COMMANDER IN CHIEF

30 DEC 1988

Mr Edward Higgins
Editorial Editor
St Louis Post-Dispatch

Dear Mr Higgins

Your recent editorial, "Don't Make Space Shield a Space Sword" (December 2) reaches its conclusions based on erroneous or incomplete information.

For the record, I believe the progress in the Strategic Defense Initiative research program has been remarkable. After "five years and $16 billion," the SDI has demonstrated technologies sufficiently so there no longer should be a debate about whether or not the principle of anti-ballistic missile defense will work. The real issue is whether the United States wishes to shift from an offense-based deterrence philosophy to a balanced offense-defense-based philosophy. I believe we should recover control of our national destiny through our active defense in lieu of depending on Soviet "strategic philanthropy." I am not aware of any administration leaders who advocate the use of SDI in the antisatellite role. That is not to say, however, we should continue our deferrence to the Soviet Union in space control.

Rhetoric aside, the Soviet Union maintains the only operational antisatellite capability in the world. It poses a continuing threat to our space systems which have proved important in our modern defense planning and programs. At the same time, the Soviets have demonstrated increasing reliance upon more sophisticated space systems for attainment of their military objectives. This dependence is supported by a well-developed and well-exercised infrastructure of manufacturing, processing, and launching facilities which ensure the Soviets can expand their on-orbit space capabilities virtually at will. In a crisis or conflict, this would put the United States at a distinct disadvantage.

In addition, the assertion of the Soviet Union not testing their antisatellite system in space since 1982 needs further examination. The statement veils the more important fact that every aspect of their coorbital antisatellite system--including tracking radars, the launcher, and on-orbit rendezvous techniques--is practiced routinely as part of their substantial space program and thus are capable of employment on a moment's notice. Moreover, the SL-11 booster which places the Soviet ASAT in the same orbital plane with its victim is used to launch other warfighting spacecraft, and has been launched more than 25 times since their self-imposed moratorium. That is more than all successful U.S. launches conducted in the last three years.

Today, the United States has no demonstrated capability to hold Soviet space assets at the same level of risk as they pose to our systems. Enclosed is a Background Paper which summarizes the U.S. Space Command perspective on the antisatellite issue. The danger to our space assets exists, and if the Soviets chose to employ their antisatellite capabilities, we would have few alternatives except to escalate the crisis on earth. Such a situation is a threat to our national security and must be understood by the American people as they determine what our next steps should be in space-based support to national defense.

Sincerely

JOHN L. PIOTROWSKI
General, USAF
Commander in Chief

1 Atch
Background Paper

NOTE: GEN Piotrowski's letter appeared in the 25 Jan 1989 edition of the St. Louis Post-Dispatch

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

UNITED STATES SPACE COMMAND
PETERSON AIR FORCE BASE, COLORADO 80914-5003

27 DEC 1988

Mr George Cotliar
Managing Editor
Los Angeles Times

Dear Mr Cotliar

Your recent editorial on efforts to develop a United States antisatellite capability ("Nothing to Gain," December 7) seems to reflect erroneous or incomplete perceptions of the circumstances facing the United States in space.

I certainly agree with your position of space systems being important to peace. This importance underscores the inherent danger in a situation where the Soviet Union maintains the world's only demonstrated operational antisatellite system. If the Soviets chose to employ their system today, there is nothing we could do to stop them or to deter them in any way. The President's response options would be limited to escalation of the situation closer to the Earth's surface.

While the United States' dependence on space systems for national security has been growing for several years, it is also apparent the Soviets are equally dependent upon space systems for their own military objectives. In recent years, they have also demonstrated increasing technological sophistication until today they maintain more than 150 spacecraft on orbit; of those, about 90 percent are totally or partially devoted to military missions. In a crisis or conflict, we would have no way of negating that capability, especially those systems which pose direct threats to our own soldiers, sailors, and airmen.

It is a disservice to the American public to continue to refer to the Soviet co-orbital antisatellite system as primitive or untested in recent years. In fact, it is operational and has been demonstrated effective. The component parts--tracking radars, launchers and launch systems, and on-orbit intercept techniques--are routinely practiced or employed in the Soviet's substantial space program. Their antisatellite system is ready and available for use today against our satellites. The United States' lack of an antisatellite counterpart severely restricts my ability to fulfill my assigned mission of space control. In effect, we have yielded control of space to the Soviets. I do not believe that serves our national defense interests.

Last year, the Congress wisely abandoned the effort to restrain development and testing in space of antisatellite capabilities for the United States. I support their decision and hope to see progress in developing a United States counter to the Soviet monopoly in antisatellite capabilities. The enclosed Background Paper summarizes the U.S. Space Command view of the current antisatellite imbalance.

Sincerely

John L Piotrowski

JOHN L. PIOTROWSKI
General, USAF
Commander in Chief

1 Atch
Background Paper

I would be pleased to discuss the ASAT issue with you or your editorial board.

JP

NOTE: GEN Piotrowski's letter appeared in the 30 Jan 1989 edition of the Los Angeles Times

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Military Developments in Space

GENERAL JOHN L PIOTROWSKI, USAF

The author is Commander-in-Chief, North American Aerospace Defence Command and United States Space Command. This contribution originated in a lecture given at the RUSI.

POTENTIAL SCENARIOS of future conflicts suggest that, if military forces are to achieve their desired results, they must operate effectively in four media—on land, at sea, in the atmosphere, and in space.

There is, in my opinion, one overarching military space imperative. The imperative is to step up to the challenge, to more effectively employ space and space-based systems in our strategy of deterrence. To fulfil that goal requires us, first, to coldly and objectively assess our own military space capabilities and the capabilities of our adversaries. Having made that evaluation, we must then have the resolve to take those actions and invest those resources necessary to preserve our ability to deter and, should deterrence fail, to use space and space systems to meet national and Alliance warfighting objectives.

Before I outline some thoughts on relative military space capabilities, let me say a few words on the United States Space Command.

The United States Department of Defense has been actively involved in space-related programmes since the mid-1950s. In 1958, the National Aeronautics and Space Administration was established to administer the civilian aspects of our space programme, while the Department of Defense retained responsibility for the national security aspects. Within the Department of Defense, each of the military departments pursued space programmes tailored largely to the needs of their own particular services. Over time, both the Air Force and the Navy established sizeable acquisition organisations that also conducted space operations.

As our dependence on space systems grew dramatically during the 1960s and 1970s, these systems continued to be operated for the most part by research and development agencies of the three separate military departments. Unlike land, sea, and air forces, our space-related resources were not formally incorporated into the unified and specified command structure—no single organisation or commander was responsible for their peacetime operation or integrated employment in wartime. While that arrangement was awkward, it was manageable in peacetime. However, lessons learned during daily operations and military exercises have indicated that the customary way of doing business in space could be much improved for crisis management, the transition to war, or during wartime. Thus, the Joint Chiefs of Staff, with the approval of the Secretary of Defense, recommended the activation of a unified space command comprised of Army, Navy, and Air Force components under a single Commander-in-Chief. President Reagan approved that recommendation, and the United States Space Command was activated in September 1985, with its headquarters at Peterson Air Force Base, Colorado Springs, Colorado.

The command is comprised of three component organisations: the Air Force Space Command headquartered in Colorado Springs; the Naval Space Command at Dahlgren, Virginia; and the Army Space Command, also located in Colorado Springs. The command is supported by a headquarters staff of approximately 600 personnel. Including the three component commands, there are approximately 15,000 personnel assigned to the United States Space Command.

The Air Force Space Command has the mission of operating and providing resource management for 29 worldwide missile warning and space surveillance and satellite operations facilities. The Naval Space Command is comprised of the Naval Astronautics Group, which operates the Navy Navigation Satellite System and the Naval Space Surveillance System, a ground-based array of sensors that monitors the activity of orbiting spacecraft. The Army Space Command plans the Army's participation in military space programmes, and operates the Department of Defense's Communications Satellite system.

MISSIONS

The missions of the United States Space Command cover two broad areas: space operations and aerospace defence. Space operations include both space control and space support activities. Aerospace defence consists of surveillance and warning as well as the requirements, development and planning necessary to support the mission of defending against a ballistic missile attack should a decision be made to deploy ballistic missile defence systems.

OPERATIONS

Space, like the world's oceans, is an international regime. As a nation, the United States maintains its right to free passage through space and, like ships at sea, our spacecraft are also the sovereign possessions of our country. Space control operations, like sea control operations, are planned and carried out with the objective of guaranteeing our right to unimpeded operations in, and free passage through, space. But again, space, like the sea, is a medium in which our right to free passage is sometimes challenged and in time of war, would have to be enforced. Deterring aggressive behaviour in space and successfully countering it if deterrence were to fail, requires that we are first able to "know" what is happening there, and that requires the ability to effectively survey space.

Today the United States Space Command operates a satellite early warning system which detects the launch of space boosters early in their flight, providing a prompt indication that a new foreign payload is being placed in orbit. A worldwide, ground-based array of mechanical radars, newer phased array radars, and optical sensors track the new spacecraft once it achieves earth orbit. Data from these sensors is continuously transmitted—much of it over communications satellites—to the United States Space Command's Space Surveillance Center located at Cheyenne Mountain Air Force Base, Colorado. The Space Surveillance Center organises, coordinates, and directs the activity at each surveillance sensor to ensure they are used as efficiently as possible.

The people who operate our space surveillance network are faced with a tremendous task. They complete approximately 55,000 space observations each day to keep track of some 6,000 objects in orbit up to geo-synchronous altitudes; more than 300 are operational payloads. In the event of a crisis or conflict, especially involving the interests of the Soviet Union, that number would probably increase significantly.

It is entirely possible that future conflicts could begin in space. It is difficult to imagine the Soviets beginning a conflict and not attacking our space-based systems in the process. For that reason, we closely monitor Soviet activity which could represent a potential threat to friendly space objects. In the event of one of our spacecraft being threatened, personnel in the Space Defense Operations Center would provide warning to the owner and operator of the threatened satellite.

SPACE CONTROL

The space control mission also requires that we have the ability to deny an adversary freedom of action in space during conflict. Soviet space systems and the military capability they provide to their land, sea, and air forces pose a serious threat to our terrestrial forces. Currently the United States does not possess an operational anti-satellite system capable of deterring aggressive Soviet acts in space, responding in kind to Soviet preliminary use of their anti-satellite system, or negating their space systems which place our people and forces at risk. Unfortunately, while the United States has debated, delayed, and deferred for nearly 10 years on this issue, the Soviets have proceeded at a deliberate and alarming pace with the development and deployment of anti-satellite and other threatening space systems.

SPACE SUPPORT

The United States Space Command is also in the support business. In a similar way to the military transportation commands, it provides support for US and Allied forces, commands, and troops who are engaged in combat or who support combat operations. Space support operations include supporting the launch and on-orbit operation of communications, navigation, and surveillance systems assigned to the United States Space Command, and ensuring that the vital information they provide is received when and where it is needed.

The first warning of a strategic attack on the United States or our allies would probably be provided by our missile warning system. First, space-based early warning satellites would detect either submarine or land-based ballistic missile launches early in flight. The Ballistic Missile Early Warning System radars, including the one located at Fylingdales Moor, or phased array radars located on the borders of the United States, would then detect and track the threatening missiles. Data from each of

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these sophisticated and reliable sensors is transmitted to and processed by personnel in the Missile Warning Center located in Cheyenne Mountain. The combination of space-based systems using infrared sensors and ground-based radars provides "dual phenomenology" detection and tracking of threatening events needed to provide the National Command Authorities with prompt and reliable warning information.

The technology embodied in our missile warning radars also gives these sensors the capability to simultaneously conduct the space surveillance operations discussed earlier. In fact, our missile warning facilities conduct a large percentage of the thousands of space observations made every day.

The growing importance of space as an operational medium and the incredible capability space systems provide to land, sea, and air forces suggest that the United States Space Command faces a future filled with challenges and opportunities. There is no doubt that the major challenge will be posed by a Soviet military space programme, a programme characterised by continuous growth, increasing technological sophistication, and by systems that significantly enhance the warfighting potential of Soviet terrestrial forces. The Soviets fully recognise the strategic importance of space, and it is equally clear that they seek to dominate us in that arena.

SOVIET SPACE OPERATIONS

Since 1957, the Soviets have conducted nearly 2,000 space launches, at least 90 per cent of which have had military or military-related missions: photo-reconnaissance, military communications, surveillance, navigation, and targeting. Today, Soviet space systems and the capabilities they provide are fully integrated into the operation of their land, sea, and air forces. Soviet space systems have greatly enhanced the capabilities of Warsaw Pact forces and, therefore, represent a significant military threat to NATO. The scope of that threat is as worrisome as it is broad.

The Soviets possess the largest and most responsive space infrastructure in the world. Compared to the United States and our Allies, they have twice as many launch pads, annually conduct almost 10 times as many space launches and put five times the weight into orbit. Not only are their space forces numerically larger than those of the collective NATO nations, but the Soviets also have a superior space system replenishment capability. Whereas it takes the United States, for example, months to prepare and launch a spacecraft, the Soviets can launch their space systems in weeks or in some cases, days. Normal space launch operations for the Soviets are characterised by one space launch every four days. In a crisis, however, they can reduce this "normal" interval considerably. During the Falklands Conflict, for example, the Soviets conducted 28 space launches in just 69 days. Not only did this represent launching one-third of their annual total in just over two months, it also exceeded all the successful launches conducted by the United States in 1985 and 1986 combined.

Moreover, the Soviet space arsenal includes an impressive and formidable array of anti-spacecraft weaponry: an operational co-orbital spacecraft interceptor with a conventional warhead that is able to engage many of our militarily significant low-earth orbiting spacecraft; "soft-kill" lasers of Sary Shagan possibly capable of causing degradation or damage to Allied space systems; direct ascent nuclear-armed GALOSH anti-ballistic missiles which also have an inherent anti-spacecraft capability; and electronic warfare capability. This mix of weaponry could be used to control space during a crisis or during the critical early stages of a conflict—to deny freedom of action in that medium to opposing forces.

Other Soviet space systems—such as the Radar Ocean Reconnaissance Satellite (RORSAT) and Electronic Ocean Reconnaissance Satellite (EORSAT)—are designed to track Alliance naval forces and provide terrestrial and maritime weapons platforms with the targeting data required for prompt attack by land, sea, and air-launched stand-off weapons. Soviet space control and space-based force enhancement capabilities, including existing and potential capabilities provided by manned Soviet systems, have added a new and important dimension to the threat arrayed against the Alliance.

THE FUTURE

In the relatively short period of 30 years, space systems have in many ways transformed the manner in which terrestrial forces are employed, and that transformation will continue. Yet, because space forces are unseen, there is often a tendency to underestimate or misunderstand the many critical contributions they make to the warfighting capabilities of the more visible terrestrial and maritime forces. In the case of NATO, all its forces—land, naval, and air—would be less effective in deterrence and war-fighting without the pervasive presence of space systems.

We need, first, to acknowledge that the Soviet Union has its own very ambitious space goals. Towards that end, the Soviets have developed the world's largest and—by a wide margin—most responsive space infrastructure. We must be aware that they have developed space systems and a launch capability which are more than adequate for peacetime, but that appear to be better suited to war-fighting, and war support, than to anything else.

Next, we need to be aware that those Soviet capabilities that are worrisome in peacetime would become threatening in crisis or conflict. Thus, we must structure our own military space capabilities to operate effectively in an environment that would most assuredly be contested in crisis or conflict.

This, in turn, requires a more responsive launch capability to ensure access to space in peace and conflict. It also requires more robust and more survivable satellite constellations. And, finally, we require an authentic and fully operational anti-satellite capability to deter aggression in space—and should deterrence fail, to enforce our right of free passage or disable the space systems that an adversary is using to support hostile action against our terrestrial and maritime forces.

One of my tasks as the Commander-in-Chief of the United States Space Command is to give visibility to space, to allow it to show its contributions, to illuminate its effectiveness, and to reveal its potential. While much can be said, unfortunately much more must remain unsaid.

The role of the United States Space Command is to provide national agencies, United States unified and specified commands, and our Allies with the necessary space-borne assets needed to carry out national and international security objectives. This role will increase in importance in the future. The United States Space Command will continue to work with these users to identify and define requirements which can be accomplished by space-based systems. Through creative applications of existing systems, new technological advances in computer and communications systems, manufacturing procedures, sensing and other space-related systems, the United States Space Command will continue to support future requirements.

The United States' ability to carry out a viable space programme in the future and to meet the demands placed upon it will not be easy. As the Soviet Union continues its major national commitment to the military exploitation of space, this commitment will undoubtedly result in major new space systems in the future. Imaginative leadership and forward looking decision-making will enable the United States Command to continue accomplishing its mission in support of the common defence.